

DELTA PROTECTION COMMISSION

14215 RIVER ROAD, P.O. BOX 530

WALNUT GROVE, CA 95690

Phone (916) 776-2290 / FAX (916) 776-2293

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Solano Counties**Cities of Sacramento and
Yolo Counties**Central Delta Reclamation Districts**North Delta Reclamation Districts**South Delta Reclamation Districts**Business, Transportation and
Housing**Department of Food and
Agriculture**Natural Resources Agency**State Lands Commission*

January 10, 2011

Cindy Messer
Delta Conservancy
3500 Industrial Boulevard
West Sacramento, California 95691

Subject: Delta Protection Advisory Committee

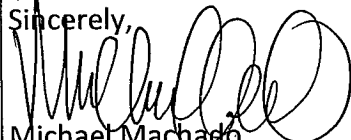
Dear Ms. Messer:

The Delta Protection Commission is seeking community members to serve on the new Delta Protection Advisory Committee (DPAC) as a result of recent State Legislation. Under the Provisions of SB X7-1 and Pursuant to Section 29753 of the Public Resources Code, the Delta Protection Commission (DPC) shall create a Delta Protection Advisory Committee to provide recommendations to the DPC on the diverse interests in the Delta. DPAC will provide recommendations to the DPC on such topics as the: Delta's ecosystem; water supply; socioeconomic sustainability; recreation; agriculture; flood control; environment; water resources; state, local, and utility infrastructure; and other related Delta issues.

DPAC will consist of no more than eleven (11) voting members from various groups and organizations. We are required to have someone representing the Delta Conservancy. Thus, we are requesting either yourself or another knowledgeable person be assigned to DPAC. The DPAC will meet at the call of the Committee Chairperson with the approval of the DPC's Executive Director. Meetings may be held less or more frequently as required by the workload of the DPAC, but in no case less than once per year.

Please contact Jessica Becerra at (916) 776.2291 or Jessica.becerra@delta.ca.gov to inform us if there are willing individuals who would like to be part of this great opportunity and join DPAC. We look forward to working with you in the future.

Sincerely,


Michael Machado
Executive Director

Enclosure

DELTA PROTECTION COMMISSION

APPLICATION FOR DELTA PROTECTION ADVISORY COMMITTEE (DPAC)

2010 Appointment Application

Name _____

Home Address _____ Zip _____

Home Phone _____ Work Phone _____ Email _____

1. Briefly describe why you wish to serve on this Advisory Committee.
2. Describe your qualifications and/or skills which would benefit this Advisory Committee.
3. Describe your involvement in the Delta.

4. Please state your current position.

5. List your educational and professional background and its relation to the Delta.

6. List the names of any committees, commissions, councils, etc. you currently belong to.

Please submit application and a Letter of Interest, no later than Friday, November 19, 2010, to:

Delta Protection Commission
ATTN: DPAC
PO Box 530
Walnut Grove, CA 95690

For further information please contact the Delta Protection Commission at 916 776-2290 or at www.delta.ca.gov

Delta Protection Advisory Committee (DPAC)

Charter

Approved - 8/26/10

I. Official Designation

Delta Protection Advisory Committee pursuant to Section 29753 of the Public Resources Code.

II. Scope and Objectives

The purpose of the Delta Protection Advisory Committee (DPAC) is to provide recommendations to the Delta Protection Commission (DPC) on the diverse interests within the Delta.

III. Description of Duties

DPAC will provide recommendations to the DPC relating to the following:

- A. Delta's ecosystem;
- B. Water Supply;
- C. Socioeconomic sustainability;
- D. Recreation;
- E. Agriculture;
- F. Flood Control;
- G. Environment;
- H. Water Resources;
- I. State, Local, and Utility Infrastructure;
- J. Other Delta Issues.

The DPAC will provide its advice based upon input from and cooperation with other stakeholders and existing organizations addressing Delta issues.

IV. Duration

The DPAC has no sunset provisions and is expected to operate indefinitely. However, the DPAC's continuance is subject to review and renewal of this Charter every two (2) years on the biennial anniversary of the adoption of this Charter.

V. Agency Official to Whom the DPAC Reports

The DPAC reports to the Delta Protection Commission through the DPC's Executive Director.

VI. Agency Responsibilities for Providing Necessary Support

All staff and support functions required for operation of the DPAC will be supplied by the DPC as determined by the Chair of the DPC.

VII. Estimated Annual Operating Costs

Currently the support for the operation of the DPAC will rely on existing staff and resources, until such time as the State may allocate funds necessary for the operation of the DPAC.

VIII. Allowances for Committee Members

Members of the DPAC and its sub-committees will serve without pay.

IX. Committee Membership

DPAC will consist of no more than 11 voting members. Members of the DPAC will be knowledgeable in and represent one or more, but not be limited to, the following groups and organizations:

- U.S. Bureau of Reclamation*;
- U.S. Fish and Wildlife Service*;
- U.S. Army Corps of Engineers*;
- Federal Government Representatives;
- State Government Representatives;
- Delegate from Delta Tribal Organizations;
- Delegate from the Delta Stewardship Council;
- Delegate from the Bay Delta Conservation Plan;
- Delegate from the Sacramento-San Joaquin Delta Conservancy Board;
- Delegate of San Joaquin Partnership;
- Delegate of Delta Reclamation Districts;
- Delegates of County Agricultural Commissioners / Farm Bureaus;
- Delegates of Environmental NGOs;
- Delegates of in-Delta Water Districts;
- Delegates of State, local and utility infrastructure interests;
- Technical Advisory Committees appointed by local governments**;
- Public Member;
- Delta farmer / rancher;
- Biologists;
- Educators;
- Industry Representatives;
- Representative of recreational boaters.

- * = Required by law to encourage participation.

- ** = Required by law to seek advice and recommendations from advisory committees appointed by local government that are involved in subject matters affecting the Delta.

No member may serve on the DPAC for more than two (2) consecutive terms. Members will serve for terms of three (3) years. However, delegates representing federal, state or local government entities will remain indefinitely. Provisions for staggering appointments to the DPAC shall be determined by the DPAC in consultation with the Executive Director and Chair of the DPC.

The Chair of the DPAC will be chosen by a majority vote of the advisory committee members, with the authorization from the Chair of the DPC or designee.

X. Estimated Number and Frequency of Meetings

The DPAC will meet at the call of the Committee Chairperson with the approval of the DPC's Executive Director. Meetings may be held less, or more frequently as required by the workload of the DPAC, but in no case less than once per year.

XI. Ethical Responsibilities of Members

No committee or subcommittee member shall participate in any specific matter including a lease, license, permit, contract, claim, agreement or related litigation with the DPC or any local or state agency in which the member has a direct financial interest.

XII. Subgroups

As deemed necessary, the Committee Chairperson, in consultation with the Executive Director of the DPC, may convene additional advisory committees, working groups or subgroups to support DPC functions. Working groups or subgroups will report directly to the DPAC.

XIII. Bagley-Keene Open Meeting Act.

As a state agency, the DPAC, Working Groups, and Sub-Groups are governed by the Bagley-Keene Open Meeting Act which requires that (1) an agenda be posted at least ten days in advance of any meeting; (2) describe specifically in that agenda the items to be transacted or discussed; and (3) refuse to add an item subsequent to the published agenda. In addition to these general requirements, the Bagley-Keene Act includes other specific provisions about how meetings are to be announced and conducted.

[Download the Bagley-Keene Open Meeting Act \[pdf\]](#)

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*Contra Costa County Board of
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Housing**Department of Food and
Agriculture**Natural Resources Agency**State Lands Commission*

January 21, 2011

Honorable Member of the Assembly
California State Assembly
State Capitol, Room 5158
Sacramento, CA. 95814

Dear Assembly Member:

SUBJECT: Delta Protection Commission Update on Primary Zone Study

Pursuant to the provisions of Senate Bill X7-1 (SB X7-1) the Delta Protection Commission (Commission) has been given the task of preparing a recommendation regarding the potential expansion of, or, change to the Primary Zone or the Delta. The Commission is providing herein an update on the status of this task.

Immediately upon the enactment of SB X7-1 in February 2010, the Commission appointed a Primary Zone Study Committee (Committee) to oversee the completion of a Primary Zone Study (Study) and the development of a recommendation. The committee is comprised of Commission Members Gregg Albright, Christopher Cabaldon, Robert Ferguson, David Pegos, Mary Piepho, Larry Ruhstaller and Jan Vick. Having committed to monthly meetings in order to give the task utmost priority, the Committee immediately developed a framework to guide the process to completion in a timely manner with the intent of fully meeting the mandates of the legislation.

At the December 16, 2010 Commission meeting, project consultants presented the Commission with the Study's final report and executive summary. Following this presentation was discussion by Commission members of the Economic Sustainability Plan (ESP) which the Commission is in the process of preparing as mandated by SB X7-1. The ESP is a plan to address the on-going sustainability of the Delta economy – which includes the Legacy Towns. The process of developing the ESP will by definition have to consider the current and long term impacts of the Primary and Secondary Zones on economic sustainability.

It is expected that the ESP will discuss and make recommendations regarding the Primary and Secondary Zones as it relates to economic sustainability of the Delta; therefore, the Commission accepted the final report, but deferred making recommendations for changes to the Primary and/or Secondary Zones pending completion of the Economic Sustainability Plan.

Honorable Member of the Assembly
January 21, 2011
Page Two

Attached is the Executive Summary of the Delta Protection Commission's Primary Zone Study Final Report, the full report can be accessed online at www.delta.ca.gov. You may also request a hardcopy of the full report by contacting the commission at the number below.

Thank you for the opportunity to provide this update. Any questions pertaining to the Study or information provided herein can be directed to me as Chair of the Commission or to Michael Machado, Executive Director at (916) 776-2290 or michael.machado@delta.ca.gov.

Sincerely,



Don Nottoli
Chair

Attachment: Final Report

cc: Members, Delta Stewardship Council
Members, Delta Conservancy
Secretary, California Natural Resources Agency
Members, Delta Protection Commission
Executive Director, Delta Protection Commission



Executive Summary

Study Purpose

Senate Bill X7 1 directs the Delta Protection Commission to prepare and submit to the Legislature recommendations regarding the potential expansion of or change to the Primary Zone or the Delta, including recommendations on the status of: Rio Vista, Isleton, Bethel Island, Brannan-Andrus Island, Cosumnes/Mokelumne Floodway, and the San Joaquin/South Delta Study Area. The Primary Zone Study has been prepared to provide the Delta Protection Commission with the analytical framework for developing recommendations for the Legislature.

One of the basic objectives of the Delta Protection Act of 1992 is to protect, maintain, enhance and restore the key agricultural, wildlife, and recreational resources of the Delta. This objective provides the basic framework for assessing the resource characteristics within the legal Delta and their contribution to the Delta's unique character. The Delta Protection Commission is also directed by Senate Bill X7 1 to consider and plan for the economic sustainability of the Sacramento San Joaquin Delta and to consider the Delta as a Place.

The key purpose of the Primary Zone Study has been to define those areas of the Delta that contain the unique agricultural, recreational, wildlife and cultural resources that are clearly representative of the Delta. Defining these uniquely Delta areas provides the bases for the recommendations to be submitted to the Legislature regarding the potential expansion of or change to the Primary Zone or the Delta.

Study Approach

As stated above, a basic objective of the Delta Protection Act includes protecting the key agricultural, wildlife, and recreational resources of the Delta and this objective was a driving force in developing the approach to preparing the Primary Zone Study.

The first task of the consultant team in defining the study approach was to delineate the study area boundaries. Because little direction was provided in the legislation, the consultant team researched the legislative intent and the origins of the six identified study areas. The consultant team determined that the Delta Vision document prepared by the Governor's Blue Ribbon Task Force on January 29, 2008 provided some geographic context for the six study areas. Based on geographic descriptions included in the Delta Vision document, the consultant team prepared preliminary study area boundary maps and worked with the Primary Zone Study Committee to refine the map boundaries. Based on input provided by the Committee and interested community members, the Committee's understanding of the intent of the Delta Protection Act as it applies to the Primary Zone, and the expertise of the consultant team, the Committee and consultant team developed the appropriate boundaries for the study areas. Final maps were prepared by the consultant team and were submitted to and adopted by the Delta Protection Commission.

In order to evaluate the six study areas, the consultant team collected extensive data regarding the unique characteristics and resources within each study area. To be able to present this data in a usable form to the Committee, the consultant team proposed the use of an Analysis Matrix to analytically evaluate data within individual study areas. The Analysis Matrix provides a visual representation of the resource characteristics of each individual study area. Due to the unique character and diversity of the Cosumnes/Mokelumne River Study Area, it was divided into three separate areas in the Analysis Matrix.

The Committee identified the key evaluation criteria to be used by the consultant team in developing the Analysis Matrix. The consultant team refined these criteria based on their ability to provide useful information and feedback related to potential boundary line adjustments. These evaluation criteria are described in detail in Chapter 5 of this Study. The Analysis Matrices for each study area are also included in Chapter 5.

The consultant team initially considered ranking the criteria according to a fairly subjective assessment of whether the criteria had a low, medium or high compatibility with the Delta resource protection objectives of preserving and enhancing agriculture, recreation, wildlife, and the Delta as a place. However, based on direction provided by the Committee and input from community members, the consultant team revised the analysis approach in order to incorporate a more objective methodology. For each criteria evaluated, the Analysis Matrix identifies whether the resource criteria is applicable to the study area or not, based on the objective definitions of the criteria.

Once the Analysis Matrices for each study area were completed, the consultant team assessed the results. For each study area, the consultant team determined whether the majority of the resource criteria were supportive of the Delta resource protection objectives of preserving and enhancing agriculture, recreation, wildlife, and the Delta as a place. If the preponderance of the evidence suggested that the individual study areas were supportive of the identified Delta resource protection objectives as defined by the evaluation criteria, a recommendation was developed to include that study area within the Primary Zone. However, if the preponderance of the evidence did not suggest that the individual study areas were supportive of the identified Delta resource protection objectives, a recommendation was developed to keep the study area within the Secondary Zone. The specific recommendations for each study area are identified in detail below.

Summary of Community Meetings

The Delta Protection Committee made clear during the preparation of the Primary Zone Study that community outreach would be a critical component of the process. Based on their commitment to get input from the people that would be directly affected by any changes in boundaries within the Delta, the Committee held two community workshops to discuss the Primary Zone Study immediately following the hiring of a consultant. These included two community workshops held in Courtland and Isleton on June 22 and 23, 2010, respectively. Interviews were also conducted with local government representatives for each of the five Delta Counties, with community groups and with private individuals within the Primary Zone Study boundaries. In addition, the monthly meetings held by the Committee were open to the public and the minutes from all of these meetings are included on the Delta Protection Commission's website.

The Delta Protection Commission and consultant team held three additional Community Meetings to present the results of the Delta Primary Zone Study. Meetings were held on November 3 at the Brentwood Senior Activity Center, November 4 at the Thornton Community Hall, and November 9 at the Rio Vista City Hall.

Approximately 20 community members were in attendance at each meeting, as well as representatives from the Delta Protection Commission.

The community members were presented seven maps delineating the overall Delta area and the six study areas. At each meeting, an introduction was provided by Mike Machado, Executive Director of the Delta Protection Commission. The consultant team presented an overview of the study and the proposed recommendations for each area. The consultants then asked participants for their questions and comments. In addition, the participants were offered comment cards and were provided a phone number for follow-up questions and comments.

A number of the community members attended the meeting due to an interest in water diversion projects being proposed by the State and were concerned that the Primary Zone Study was connection with the State's proposed water diversion activities.

Primary Zone Study Recommendations

The analysis conducted in preparing the Primary Zone Study resulted in specific recommendations regarding boundary line adjustments within the Delta. These recommendations are based on the geographic and planning criteria that were integrated into the Analysis Matrices and objective interpretations of these criteria by the consultant team. Therefore, these recommendations are presented from a planning perspective and are not intended to incorporate the broad range of issues and considerations that need to be considered by the Delta Protection Commission in submitting recommendations to the Legislature. The consultant team's recommendations are as follows:

Recommendation #1 – Redesignate the following study areas within the Secondary Zone as Primary Zone: Cosumnes/Mokelumne River Central, Bethel Island and Andrus/Brannan Island.

Recommendation #2 - Maintain the Secondary Zone designation for the following study areas: Cosumnes/Mokelumne River North, Cosumnes/Mokelumne River South, Isleton, and San Joaquin River/South Delta.

Recommendation #3 – Designate the Primary Zone area within the City of Rio Vista as Secondary Zone.

These recommendations were submitted to the Delta Primary Zone Committee on November 22, 2010 for their consideration. At this meeting, the Committee agreed to forward these recommendations to the Delta Protection Commission for their consideration on December 16, 2010. The Committee also requested that information regarding the Rio Vista Study Area be forwarded to the Delta Protection Commission for consideration. This information is described below.

In a letter submitted to the Delta Protection Commission on July 21, 2010, the City of Rio Vista requested that the Primary Zone Study Committee consider expanding the boundary of the legal Delta to include the boundaries of the entire City and that the entire City be included within the Secondary Zone. Although the proposed expansion of the legal Delta to accommodate the City's request is not included as one of the consultant team's recommendations, this request is within the scope of Senate Bill X7 1 and is appropriate for the Delta Protection Commission to consider in their development of recommendations for the Legislature.



**State & Federal Contractors
Water Agency**

1121 L Street, Suite 1045, Sacramento, CA 95814

January 14, 2011

Sacramento-San Joaquin Delta Conservancy
c/o Ms. Nancy Ullrey
3500 Industrial Blvd
West Sacramento, CA 95691

Dear Ms. Ullrey:

The State and Federal Contractors Water Agency (SFCWA)* appreciates the opportunity to provide the following comments and suggested edits regarding the draft Interim Strategic Plan to be considered by the Conservancy at its January 19, 2011 meeting. We look forward to working constructively with the Conservancy as it moves forward in seeking to achieve its mission consistent with the direction provided in its authorizing legislation.

[Note: The following comments are based upon the redline version of the draft recommended by the Strategic Plan subcommittee.]

Page 7, ¶ 2, Line 1: The recommended change from "a primary state agency" to "the primary state agency" is inappropriate and inconsistent with the Conservancy's authorizing legislation (see section 32322). The legislative language should be used. This comment also applies to Page 11, ¶ 1, Line 1; Page 15, 1st bullet, Line 1; Page 23, 1st bullet, Line 1; Page 41, Long-Term Goal heading in the middle of the page; and, Page 41, last line of the page.

Page 7, ¶ 4, Line 5: With regard to the coequal goals of ecosystem restoration and improved water supply reliability, no single agency or plan will achieve them. It will take complementary efforts by many. Consequently, we suggest rather than "will accomplish this broad mission" either "will help accomplish this broad mission" or "will contribute to the accomplishment of this broad mission".

Page 8, ¶ 4, Line 3: Considering the statutory deadline of two years after the hiring of an Executive Officer (which is expect to be done this year (2011)), it would seem that the interim strategic plan would be superseded in 2013, and not be controlling "through 2014". This should be revised or an explanation provided as to why "through 2014" is considered appropriate.

* SFCWA is a Joint Powers Authority of water contractors that receive water from the State Water Project and the Central Valley Project. Together, SFCWA members serve over 25 million Californians and provide water to irrigate more than 3 million acres of the nation's most productive agricultural lands. SFCWA's mission is to assist its member agencies in assuring a sufficient, reliable and high quality water supply for their customers and maximize the efficient operation and integration of the State Water Project and federal Central Valley Project.

Directors

James M. Beck
*Kern County Water
Agency*

Jeff Kightlinger
*Metropolitan Water
District of Southern
California*

Bill Harrison
Dan Nelson
Jason Peltier
*San Luis & Delta-
Mendota Water
Authority*

Beau Goldie
*Santa Clara Valley
Water District*

Steve Robbins
Jill Duerig
*State Water Project
Contractors
Authority*

Tom Birmingham
*Westlands Water
District*

Page 12, ¶ 2, Line 5: "parts of" should be left in the description since the entire Yolo Bypass is not within the Delta, which, along with the Suisun Marsh, is the legislated jurisdictional limit of the Conservancy's authority (see section 32360(a)), unless and until the Conservancy makes specific findings consistent with section 32360.5 regarding a proposed activity that will occur outside the Delta or Suisun Marsh.

Page 17, ¶ 3, Line 2: The statement that the Conservancy believes it will complete the "final strategic plan in 2011" is confusing when considered in conjunction with the statement on page 8 regarding the interim plan being utilized "through 2014" and the legislative deadline for the strategic plan to be completed within two years of the hiring of the Executive Officer, which will also occur in 2011. It would seem more appropriate to substitute "final strategic plan by the end of 2013."

Page 22, last bullet, Line 4: Because the Delta is not the source of the water conveyed through the Delta to the State Water Project (SWP) and federal Central Valley Project (CVP) pumping plants, the use of "providing" is inaccurate. Instead, we suggest "including its central role in the delivery of water supplies to two-thirds of the state". This comment is also applicable to Page 37, 5th bullet, Line 3.

Page 25, ¶ 3, Line 4: The Delta-Suisun is not the "major source of California's water supply". The source of water supply for the state is precipitation, particularly that which falls as snow in the Sierra Nevada. In the context of this paragraph, this clause should be deleted so the language reads "The Delta-Suisun is an ecological treasure..."

Page 25, ¶ 4, Line 2: insert "portions of" prior to "5 counties" to be more accurate.

Page 25, ¶ 4, Line 6: substitute "contributes to" for "supports".

Page 25, last line of page: delete "critical" because "critical habitat" is a term of art related to species being regulated under the Endangered Species Act and this sentence references all species in the Delta, not just those of special concern.

Page 27, 4th bullet: the water delivered by the SWP/CVP is not "from the Delta"; rather, it is "conveyed through the Delta". The East Bay Area's supply reference is diverted upstream of the Delta (EBMUD), from the Delta (CCWD), and transported across the Delta (Zone 7, ACWD). Surprisingly, there is no mention of the major upstream diversion of the SFPUC. Finally, the SWP/CVP serve more than 3 million acres of agricultural lands, rather than the 2.5 million mentioned. We suggest the following rewrite of the bullet into two bullets:

- About 2/3 of Californians rely on water transported across the Delta for some portion of their drinking water, including many residents of the East and South Bay Area; and more than 3 million acres of agricultural land outside of the Delta are irrigated with water pumped by SWP and CVP facilities in the southern Delta.
- The East Bay Municipal Utility District and the San Francisco Public Utilities Commission rely on water diverted out of the Delta watershed, upstream of the Delta, to serve their customers.

Page 27, 5th bullet: water quality isn't affected by "water exported from the Delta"; it's the SWP/CVP operations that affect hydrodynamics with impacts to water quality in certain

locations. We suggest changing "water exported from the Delta" to "water diversions, water project operations". Also, the last sentence that "The Delta is managed to control salinity" is a much too narrow statement. Water management related to the Delta has multiple objectives. This sentence should be deleted.

Page 27, last bullet: The figures in this bullet do not appear to be consistent with the figures included in the Delta Protection Commission's draft Economic Sustainability Plan (ESP). While the population figure is fairly close, the ESP indicates a jobs total in the Delta of 146,000 (rather than 250,000), with approximately 8,000 of those in the Primary Zone. In addition, the use of the \$35 billion figure is not consistent with the \$20 billion figure stated in the ESP. Moreover, the ESP's statement that "the available data were not adequate to generate an updated estimate of the total dollar value of the Delta economy" begs the question of where these figures were derived and they should either be changed to be consistent with the ESP or a source should be cited.

Page 29, ¶ 1, Lines 6-7: More numerous and more intense flood events are also a predicted impact of climate change, and it should be included in the list as well.

Page 29, ¶ 2, Lines 2-3: The use of "degree" and "committed" are awkward. We suggest simply stating "...adapting to the consequences of climate change."

Page 29, ¶ 3, Line 8: substitute "adaptation" for "adaption".

Page 30, ¶ 2, Line 3: To assert that the Conservancy "will take a lead role in shaping the ecosystem restoration section of the Delta Plan" is inappropriate. Certainly the Conservancy may provide input and comment, but it is the Delta Stewardship Council that will develop all sections of the Delta Plan. Moreover, most of the ecosystem restoration components of the Delta Plan have already been essentially determined in the context of the Delta Counties' local HCPs and the Bay Delta Conservation Plan's Conservation Measures. We suggest changing this sentence to read, "The Conservancy will help to shape the ecosystem restoration section..." This comment is also applicable to Page 41, Item 3 under Near-Term Strategies at the bottom of the page.

Page 40, ¶ 1, Line 8: Because the legislative mandate is that the Conservancy adopt its strategic plan within two years of hiring its Executive Officer, "next three years" should be changed to "next two years", as that is when the interim strategic plan will be superseded. This comment is also applicable to Page 44, ¶ 1, Line 4.

Thank you for your consideration.

Sincerely,



Byron M. Buck
Executive Director



SOLANO COUNTY
Department of Resource Management

675 Texas Street, Suite 5500
Fairfield, CA 94533
www.solanocounty.com

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Telephone No: (707) 784-6765
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Bill Emlen, Director
Clifford K. Covey, Assistant Director

January 20, 2011

Cindy Messer, Interim Executive Officer
Sacramento-San Joaquin Delta Conservancy
3500 Industrial Blvd.
West Sacramento, CA 95691-6521

Dear Ms. Messer:

Solano County staff has reviewed the Sacramento-San Joaquin Delta Conservancy Draft Interim Strategic Plan (ISP) dated January 6, 2011. It was very helpful to receive an overview of your guiding principles, strategic goals, mandates, long-term goals and near-term strategies and next steps.

The structure of the Conservancy's ISP and the emphasis that it places on partnering and working collaboratively with local governments and communities is encouraging. The Conservancy's mission clearly strives to achieve stated priorities for the Delta that is within its scope by partnering with others. This is admirable but also challenging given the potential stressors between the various priorities and parties. Local entities such as Solano County can play an important role in reconciling these challenges.

As the draft ISP evolves and is finalized, there are a number of issues of importance to the County that we hope will be addressed by the Strategic Plan. The County has long had concerns with various Delta plans that include large scale conversion of agricultural lands to habitat restoration projects. While the County acknowledges the potential environmental value of these type projects, we believe they must be balanced against the impacts they will have on very productive agricultural lands and the communities and local culture that are tied to these lands. Our hope is that through careful planning there may be ways to preserve important agricultural lands while allowing the habitat restoration projects and retention of the Delta community fabric and underlying economic base.

Building & Safety
David Cliche
Building Official

Planning Services
Mike Yankovich
Program Manager

Environmental
Health
Terry Schmidtbauer
Program Manager

Administrative
Services
Su Krishnan
Sr. Staff Analyst

Public Works-
Engineering
Paul Wiese
Engineering Manager

Public Works-
Operations
Wayne Spencer
Operations Manager

The County has consistently articulated the issues we would like addressed in the myriad of State and Federal Delta planning efforts. *These include mitigation of impacts on agricultural lands and production; protection of the most productive agricultural lands for continued agricultural use; service impacts on public safety entities; loss of local property taxes and the need for off-setting revenues to keep local government whole; increased road wear and tear associated with habitat projects and the need for mitigation of these impacts; assurance that sufficient long-term funding is available for ongoing maintenance of habitat areas; and the need to minimize potential restrictions of agricultural activities that are adjacent to habitat projects. We ask that issues on this list that are within in the Conservancy's purview be addressed in the final Strategic Plan.*

In addition to the general comments above, the County has a number of specific comments as highlighted below:

- There seems to be contradictory language on the timing of the Interim vs. Rural Strategic Plan. The second paragraph on page 7 indicates the Interim Plan will guide Conservancy operation through 2014. This contradicts to the statement in the second paragraph on page 214 which indicates the final plan will be completed by mid 2011. These statements should be re-evaluated and reconciled for consistency.
- If bond money does not materialize, what mechanism will the Conservancy use to categorize, prioritize and implement projects? Will it be by regional benefit, efficiency, or based on its value to the Delta?
- Long-term and Near-term strategies for implementing projects should include ongoing funding for project operations and maintenance.
- Will project evaluations be conducted after distribution of funds to ensure intended use?
- Because of the Conservancy's role in ecosystem restoration, will it play a role in developing adaptive management criteria and weighing results of habitat restoration efforts based on such criteria? Suggest that a significant Delta agency establish itself as the guardian of the adaptive management process to protect against ecosystem damage.
- This document notes five plans that the Conservancy's Interim Strategic Plan must be consistent with that do not include the Bay Delta Conservation Plan (BDCP). Although consistency with BDCP may not be a requirement, because of its potential importance to the Delta, it should be noted prominently in some fashion.
- This document should contain guidance on timing and extent of analysis of potential habitat projects and their impacts on other land uses in the vicinity. This would include possible increased flood potential and levee impacts on non-habitat lands. Early hydraulic and hydro dynamic analysis will be critical to fully assess impacts of

the creation of a new habitat area, and on unintended consequences on nearby land.

As noted above, Solano County is interested in working with the Conservancy in their efforts. You may contact me or Kathy Barnes-Jones in my office to further discuss this possibility, and hopefully arrange for follow-up steps.

Thank you in advance for your consideration.

Sincerely,

A handwritten signature in black ink, appearing to read "Bill Emlen", with a long, sweeping horizontal line extending to the right.

Bill F. Emlen
Director of Resources Management

Attachment

cc: Solano County Board of Supervisors
Birgitta Corsello, Assistant County Administrator
Amy Jenkins, Legislative, Intergovernmental and Public Information Officer
Cliff Covey, Assistant Director, Resource Management
Dan Wolk, Deputy County Counsel
Kathy Barnes-Jones, Senior Staff Analyst
David Okita, General Manager, Solano County Water Agency
Mike Hardesty, General Manager, Reclamation District 2068
Steve Chappell, Suisun Resource Conservation District
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Delta Counties Coalition

From: [Robert Pyke](mailto:bobpyke@attglobal.net) [mailto:bobpyke@attglobal.net]
Sent: Thursday, January 20, 2011 12:10 PM
To: [Cindy Messer](#) ; [Nancy Ullrey](#)
Cc: [Mary Piepho](#)
Subject: Interim Strategic Plan

Cindy, Nancy,

I am attaching a copy of the Sandstrom et al., the paper that I referred to yesterday at the board meeting, the figure from the IEP POD report that I mentioned at least to Cindy and maybe to Nancy as well, and, while I am at it, a sorting of Delta Stressors that I have prepared myself, largely on the basis of these two sources, which also tries to make a connection with solutions. I will likely use my own sorting as a component of a submission that I plan to make in due course to the Delta Stewardship Council. The Delta Independent Science Board is of course struggling with much the same question and are due to report their findings in a couple of weeks, I think.

Although I understand that it is like a minute before midnight for your Interim Strategic Plan, I would just throw out the suggestion that you might want to include Table 1 from the Sandstrom et al. paper (which actually comes from a companion paper by Moyle et al.), and possibly Figure 8 from the POD report as well, in an appendix, with very simple text in the body of the report, in lieu of or in addition to item 3 that I talked about yesterday, that would go something like this:

In anticipation of being the primary state agency to implement ecosystem restoration in the Delta, identify in the Final Strategic Plan the principles and priorities that will guide the Conservancy's participation in ecosystem restoration activities, whether they are projects sponsored by the Conservancy or sponsored by others. The broad principles will include restoring connectivity, complexity and variability to the Delta ecosystem on a landscape scale, that is, throughout the Delta, rather than on a piece-meal basis. It must also be recognized that the Delta ecosystem is not a closed system and that the ocean-bay-Delta-rivers system must be addressed as a whole. A more detailed listing of desirable habitat conditions for the Delta component is provided in Appendix B as an example.*

**this will require close co-operation with BCDC – I don't remember to what extent you have addressed that elsewhere.*

I can't see that any reasonable person could object to this addition and it has the effect of adding some technical content to what is otherwise an excellent document although limited to more administrative issues.

I guess that I am actually suggesting *in lieu of* the wording that talks about leading the effort to shape the ecosystem section of the Delta Plan. As I indicated in my remarks to the Board, I don't think that is realistic, given not only your present budget constraints

but also the politics of the DSC staff and their consultants. Certainly the Conservancy should express its views, but realistically I think that might be a matter of commenting both in writing and in appearances before the Council on the successive drafts of the Delta Plan.

Regards,

Bob

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Ecosystem Investments for the Sacramento-San Joaquin Delta: Development of a Portfolio Framework

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DRAFT WORKING PAPER

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Abstract

This paper provides background for discussion on prioritizing ecosystem investments in the Sacramento-San Joaquin Delta. Ecosystem investments involve the allocation and expenditure of financial resources, land, and water to improve ecosystem attributes, principally to support desirable plant and animal species. A framework using ten ecological criteria is provided for organizing these investments into a portfolio (or into regional portfolios) that can guide investment prioritization and timing. This framework is meant to be used in conjunction with non-ecological criteria, also presented. This portfolio contains 34 potential investments that are drawn mostly from the Bay Delta Conservation Plan, the CALFED Ecosystem Restoration Program Conservation Strategy, and the Delta Regional Ecosystem Restoration and Implementation Plan. Means to prioritize these investments are discussed.

Introduction

The Sacramento-San Joaquin Delta has undergone significant physical and biological modification over the past 150 years. These modifications involve the reclamation of 700,000 acres of tidal marsh and adjoining floodplains, along with significant changes in flow timing, amount and quality. These changes, along with abundant invasive alien species, are the cause of dramatic declines in native fish populations in the Delta. In the past 20 years, the Delta has shifted from supporting fishes and other organisms characteristic of estuarine conditions, to supporting organisms characteristic of freshwater conditions (Moyle and Bennett 2008). The State Water Resources Control Board is now engaged in a process to determine the flow regime needed for maintaining appropriate ecological conditions in the Delta. However, an improved flow regime will be most effective if it is coupled with major habitat improvements. As Petersom (2003) points out, dynamic components of an estuarine ecosystem (such as flows) are most successful if they have positive interactions with the stationary components (such as tidal marshes and floodplains). Thus, habitat restoration is necessarily part of any long-term recovery effort for the Delta that involves flows. Multiple on-going planning efforts, with the Bay Delta Conservation Plan (BDCP, 2009) foremost, seek to identify and implement ecosystem restoration efforts that will avoid extinction of desirable species and, where possible, recover their populations. To date, these processes have not prioritized habitat restoration projects, nor have they integrated them with potential water operations and facility modifications.

This paper develops a framework for selecting stationary habitats for restoration in order to best take advantage of changes in flow regime designed to reverse negative trends in desirable fish species in the Delta. This work is not intended to supplant on-going efforts to develop conservation strategies, but rather, to suggest a systematic way of prioritizing these efforts. This paper builds upon Moyle et al. (2010) that identifies the key physical attributes of the Delta that must be developed in order to support the native fishes at all stages of their life histories. These attributes are: *complexity*, in the form of physical complexity of channel, marsh, river and floodplain habitat; *variability*, in the form of a more natural distribution of flows and water quality; and *connectivity* between dynamic and stationary aspects of Delta habitats in order to sustain them. Restoring complexity, variability and connectivity has the presumed added benefit of helping suppress non-native species which are best adapted to more the homogeneous system that currently exists (Moyle and Bennett, 2008; Lund et al., 2010). A second companion paper by Fleenor et al. (2010) focuses on alternatives for future water resource facilities and operations and paper describes how flow criteria can be developed that will support the ecosystem attributes described in Moyle et al. (2010). Guided by the principles and conclusions developed in these companion papers, we develop a portfolio approach to investments in Delta ecosystems.

Ecosystem Investments

In this paper we use “ecosystem investments” to reflect activities which require investments of money, water, and land for ecosystem purposes. The term “restoration” is avoided, because it is typically used to mean returning the area of interest or ecosystem to some original or prior state. We favor the shift in meaning suggested by Jackson and Hobbs (2009), who discuss, “ecological restoration [as] emphasizing restoration of ecosystem function, goods, and services (p. 568)”. For better or worse, human-caused changes in the Delta’s physical form (diking of marshlands, deepening of ship channels, subsidence of Delta islands, rip-rapping of levees, etc.), the depletion and alteration of its freshwater inflows and outflows, along with the invasion of alien species have combined to create a largely irreversible situation. Other ongoing trends, including sea level rise, land subsidence, regional warming, and changes in inflow preclude returning the Delta back to some historical state (Lund et al. 2007). Thus, we are faced with a novel and rapidly changing Delta ecosystem. At this point, the choice is either to let the change happen and accept the ecosystem consequences or to control and direct the changes as much as possible to help create a new Delta with traits we prefer, such as abundant populations of desirable fishes. A “new” Delta that is friendlier to native species will unavoidably retain and reflect the legacy of many extensive past physical, hydrologic, and biological alterations. However, with appropriate investments this Delta also can provide many valuable ecosystem goods and services and enhance investments in water devoted to ecosystem purposes. Like financial investments, ecosystem investments have elements of risk and unpredictability. Inevitably, ecosystem investments require the outlay of real financial resources for promising but uncertain yields in improved ecosystem conditions and functionality and in terms of recovery of endangered species.

Each ecosystem investment involves actions to create habitats useful for desired species and processes. In this report, each distinct unit of ecosystem investment is referred to as an activity and we focus on what the investment is likely to accomplish. For example, an activity might increase primary production, improve water quality, or create spawning habitat for a

species of interest. Each investment should improve some part of the Delta ecosystem in a specific way as part of a portfolio of investments that collectively favors native species.

Characteristics of an ideal investment

An inventory of ecosystem investments provides a foundation for selecting promising beneficial and cost-effective projects (*i.e.*, greatest benefit on an area/cost basis over the shortest period of time). Prioritizing ecosystem investments in this way can help lead to a Delta containing dynamic heterogeneous habitats with significant seasonal and inter-annual variation. While the main purpose of ecosystem investments is to improve current environmental conditions, they should have the flexibility to remain useful in the face of incremental or rapid change. Ecosystem investments should be adaptable or resilient to environmental shifts (whether anthropogenic or natural), prolonged events such as sea level rise and shifts in runoff timing, or rapid events such as floods or earthquakes (leading to flooded islands). Additionally, these investments should anticipate, where possible, the response of ecosystems to the impacts of non-native species, both existing within the current Delta system and likely to occur in the future.

Moyle et al. (2010) provide 10 key ways to increase habitat variability and complexity in the Delta and Suisun Marsh (Table 1) to improve their abilities to support native estuarine species. These directions include: 1) establish internal Delta flows that create a tidally-mixed, upstream-downstream gradient (without cross-Delta flows) in water quality; (2) create slough networks with more natural channel geometry and less diked rip-rapped channel habitat; (3) improve flows from the Sacramento and San Joaquin rivers; (4) increase tidal marsh habitat, including shallow (1-2 m) subtidal areas, in both fresh and brackish zones of the estuary; (5) create/allow large expanses of low salinity (1-4 ppt) open water habitat in the Delta; (6) create a hydrodynamic regime where salinities in parts of the Delta and Suisun Bay and Marsh range from near-fresh to 8-10 ppt periodically (does not have to be annual) to discourage alien species and favor desirable species; (7) take species-specific actions that reduce abundance of non-native species and increase abundance of desirable species; (8) establish abundant annual floodplain habitat, with additional large areas that flood in less frequent wet years; (9) reduce inflow of agricultural and urban pollutants; and (10) improve the temperature regime in large areas of the estuary so temperatures rarely exceed 20°C during summer and fall months.

The above recommendations, designed to help create the more diverse and variable Delta that favors native species, form the ecological basis for our criteria for selecting ecosystem investments. These investments can then be integrated with other criteria (next section) to produce a framework for systematic ecosystem improvement (Table 1).

Table 1: Desirable habitat conditions for the Delta (Moyle et al. 2010)

	Ecosystem Component	Action
1	Internal tidally mixed Delta flows	Create upstream-downstream mixing without cross Delta flows
2	Slough networks	Create natural drainage systems for marsh habitats
3	River inflows	Develop fish-friendly flow regime
4	Tidal marsh	Expand tidal marsh throughout Delta and Suisun Marsh
5	Open water	Flood subsided islands in the Delta and diked marshlands in Suisun Marsh
6	Variable salinity	Manipulate hydrodynamic regime where possible
7	Increase abundance of native species	Take species-specific actions
8	Floodplains	Expand floodplain habitat and increase frequency of flooding
9	Water quality	Reduce inputs of urban and agricultural pollutants
10	Cooler summer habitats	Expand tidal marshes in areas influenced by cooler marine temperatures

The ideal Delta ecosystem investment portfolio would be a mix of short- and long-term projects that benefit ecosystem functions in the watershed and desirable species in specific regions. Implementation of the investments over an extended time would help with planning and potentially reduce costs through learning from management successes and failures.

Portfolios of ecosystem investments can be created for different scenarios. For example, if an isolated facility is chosen to route export water to the Central Valley Project (CVP) and State Water Project (SWP) facilities in the South Delta—as currently favored by BDCP-- it is necessary to develop a concurrent portfolio of ecosystem investments that best compliment that action, as outlined in Lund et al. (2010). By developing a core list of Delta ecosystem investments and scoring each investment on multiple criteria, it should be easier to select and prioritize desirable ecosystem investments for the Delta.

Development of a Portfolio

There are multiple approaches to developing a portfolio of investments, based on certain criteria for selection. The Bay Delta Conservation Plan Conservation Strategy, DRERIP and ERP Conservation Strategy all have defined metrics for selection some of which are adopted here. For the purposes of this workshop, a simplified approach to investment criteria includes:

- *Cost versus return on investment.* Priority should be given to those investments that yield high near- and long-term benefits for relatively low costs.
- *Importance for reducing extinction risk of listed species.* Near-term investments will be necessary to prevent or forestall extinction of key species. Some of these investments may not meet general criteria, but are needed to avoid extirpation.
- *Compatibility with changing conditions.* Investments should be judged on their resiliency or adaptability to changes in physical and biological conditions, including sudden events such as earthquakes, floods, and levee failures. Additionally, these investments should be

evaluated on the basis of their likelihood of enhancing invasive, alien species populations.

- *Compatibility with water resource operations and facilities.* All choices should be evaluated based on whether they constrain or are constrained by facility locations and operations. Of particular concern are habitat investments that alter hydrodynamics in ways that conflict with the objectives of nearby investments.
- *Collateral benefits.* Improved habitat function often creates benefits beyond supporting desirable species. This includes recreation, water quality, flood reduction, etc.
- *Complexity.* Investments that increase physical habitat complexity as well as area should receive higher priority
- *Variability.* Investments that closely integrate stationary habitat with flows and water resource operations are highly desirable
- *Connectivity.* Habitats should receive high priority if they are large and/or are connected to adjoining high value investments. However, reducing connectivity (*e.g.* among Delta channels) may also be desirable in some situations. This recognizes the importance of scale in investments and the role that local habitat improvements play in improving ecosystem function over a larger area.

Types of Investments

There is an array of investments that can be made to enhance or create desired ecosystem attributes. These include direct financial investments for the purchase of land, conservation or flowage easements, funding for habitat improvement design, permitting and construction, or support for activities that either enhance ecosystem services or improve access to them. Changes in flood and water resource operations and facilities can constitute an additional type of ecosystem investment, typically involving significant costs. Finally, policies and regulations are a form of investment because they usually involve financial costs and can be used to improve habitat.

For the purposes of this paper, the focus will be on identifying financial investments that conserve or create desired habitats or investments that improve the ecological function of emerging, novel habitats. These habitats are outlined below:

Flooded Islands

Levees protect island farmland and where the soils are mainly peat, there has been extensive subsidence, mainly in the south and central Delta. As discussed in a variety of recent papers (summaries in Mount and Twiss 2005; Lund et al. 2007, 2010) there is a very high probability that there will be an increase in frequency of island flooding in the future, with an equally high likelihood that some islands will not be restored following flooding (Suddeth et al. 2008, 2009). Managing these flooded islands as habitat for desirable species will be a significant challenge. Their suitability will depend upon the depth of subsidence prior to inundation as control on colonization by invasive aquatic plants, the location and size of breaches in relation to flooded island hydrodynamics and water quality, the effects on adjacent islands, and the influence of flooded islands on food webs both within the islands and in adjacent channels.

Tidal Marsh

Prior to reclamation of the Delta, the most extensive and productive habitat type within the Delta was tidal marsh. Most tidal marsh within the Delta was freshwater marsh, involving a complex mosaic of tidal channels, subtidal and intertidal flat, marsh plains (islands) and natural levees with riparian plant communities. In the far western Delta and within Suisun Marsh, tidal marsh habitat alternated between fresh and brackish, depending upon outflow conditions. All conservation efforts in the Delta, including the BDCP Conservation Strategy, have identified the development of thousands of acres of fresh and brackish tidal marsh as a high priority. While tidal marsh is not a novel habitat within the Delta, it cannot be easily created due to subsidence. For this reason, opportunities are largely limited to the fringes of the Delta and in Suisun Marsh where mineral soils or land management has reduced subsidence. Additionally, investments in creation of tidal habitat require careful planning for future conditions since tidal marsh dynamics are closely linked to sea level rise and sediment supply.

Floodplain

One of the unique aspects of the Delta as an estuary is its historic physical connection to two very large floodplain systems on the San Joaquin and Sacramento River (Moyle et al., 2009). Flood management infrastructure and water resource operations have disconnected the Delta from these floodplains except during high flow events. Extensive research funded by CALFED and other entities has demonstrated the importance of seasonally flooded habitat in supporting the life history strategies of numerous desirable fish and terrestrial species as well as supporting primary productivity and food webs within the Delta. Increasing the frequency, duration and areal extent of floodplain inundation along the periphery of the Delta has been identified as a high priority in all conservation efforts focused on the Delta and is emerging as a national priority (Opperman et al., 2009). The challenges facing investments in floodplain habitat are numerous, including current economic activity on floodplain lands, integration with flood management activity, and the potentially high costs of levee modifications and setbacks.

Riparian and Upland Habitats

Riparian zones and their connections to upland habitat once played a large role in the Delta ecosystem, supporting many physical and ecological processes and complexity including, providing large wood for cover, insects and other food sources, as well as carbon, nitrogen, phosphorous and other nutrients necessary for aquatic food webs. Although not a focus of this workshop, these habitats were critical to supporting diverse terrestrial communities. Land conversion and the construction and maintenance of levees have eliminated most riparian and upland habitat from the Delta. Creating riparian habitat is a significant challenge in most of the Delta. First, and foremost, subsided islands surrounded by narrow levees make it difficult to re-establish elevations suitable for large tracts of riparian plants. Rather, most opportunities exist in the lowermost reaches of tributaries to the Delta. Here, the greatest challenges lie in creating the physical processes necessary to recruit and sustain riparian communities. This includes setting back or breaching levees in order to establish channel migration that drives community succession and creating the proper flow regime to promote recruitment. The Cosumnes River Preserve provides the best model for investments in riparian and upland habitat.

Inventory of Major Habitat Investments

This report presents a collection of promising ecosystem investments. All ecosystem investments have been categorized based on type (described above) and location (Table 2). The locations of investment opportunities are similar to, but distinct from, those listed as Restoration Opportunity Areas in the Draft BDCP Conservation Strategy. The locations, shown in Figure 1, can be grouped into seven general areas:

- The Steamboat and Sutter Slough complex. Comprised of Steamboat, Sutter, and Elkhorn, and Miner Sloughs.
- North main stem of the Sacramento River. Includes the channel from Freeport to the confluence of the Sacramento River, Cache Slough and Steamboat Slough.
- South main stem of the Sacramento River. Includes the region from Rio Vista to the confluence of the Sacramento and San Joaquin River.
- Yolo Bypass/Cache Slough complex. This includes Lindsay Slough, Cache Slough, Yolo Bypass, Liberty Island, and Prospect Island areas.
- Eastern Delta. This region includes the North and South Forks of the Mokelumne River, Georgiana Slough, Snodgrass Slough, Cosumnes River Preserve, and Potato Slough.
- San Joaquin River. This area runs from Stockton to the confluence with the Sacramento River.
- South Delta. This includes the area south of the San Joaquin River and East of Dutch Slough.
- Suisun Marsh in its entirety.

We have identified 38 potential ecosystem investments in the seven regions of the Delta and in Suisun Marsh. Summaries of each potential large habitat investment in this inventory appear in Appendix A. Each of these investments meets one or more of the general criteria outlined above (Table 3a, b).

The Delta serves more than ecological purposes and the ability of habitat investments to contribute to human, avian, and terrestrial species both in the Delta and elsewhere will be important for policy and implementation. In addition to the criteria laid out by Moyle et al (2010) or making the Delta more of a natural estuarine ecosystem, several other criteria are likely to be important in developing a portfolio of coherent ecosystem investments. These additional criteria include costs and other non-habitat benefits related to local economic, recreational, and other benefits of improving habitats in the Delta. These are summarized in Table 5.

Figure 1: Location map for major potential habitat investments

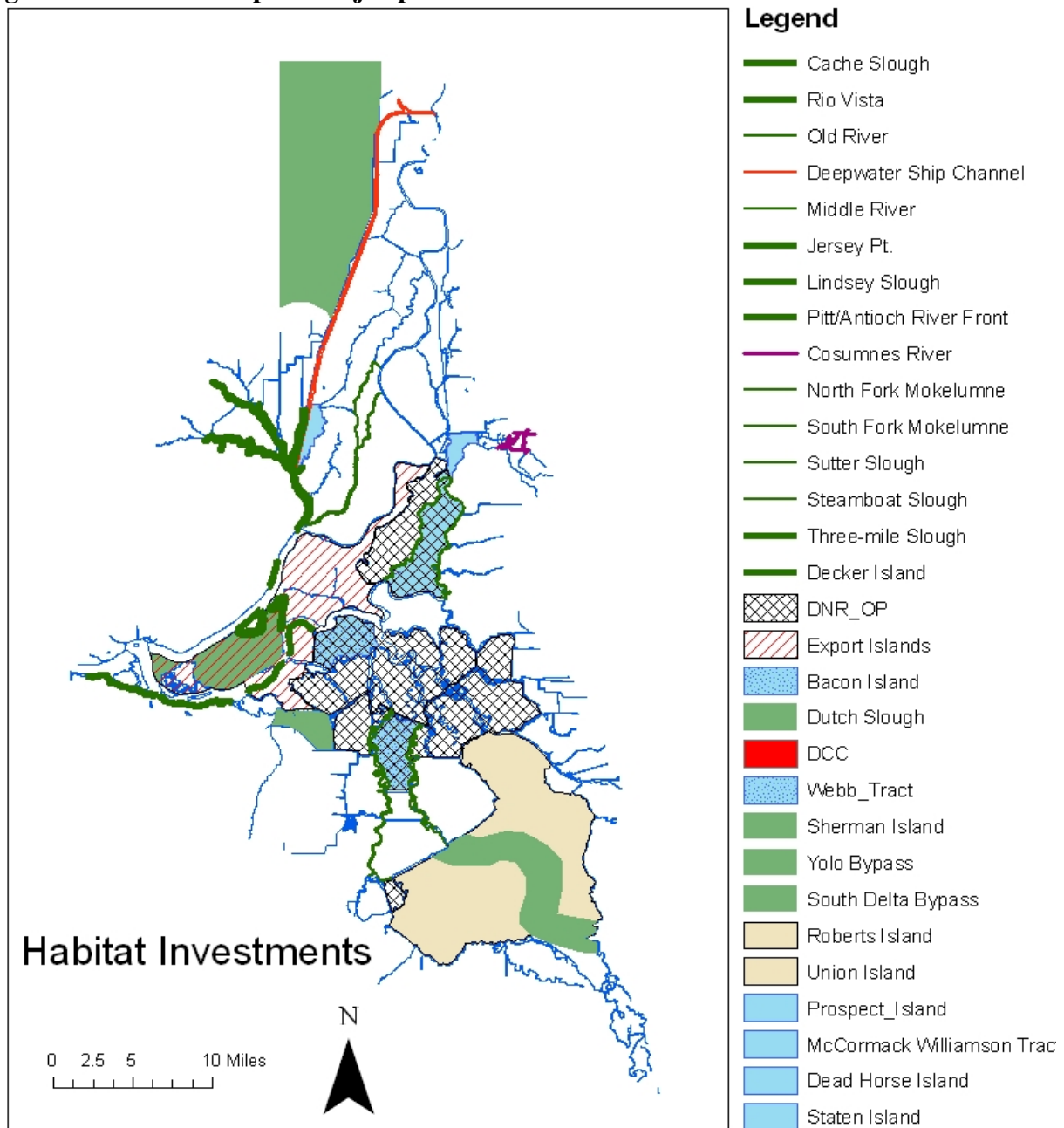


Table 2. Potential habitat investments in the Delta and Suisun Marsh, indicating the habitat types they are likely to include (green bars)

Location	Investment Type						
	Habitat Type (by sea level)					Water Operations	Other
	Flooded Island	Tidal Marsh	Floodplain	Riparian	Levee Setbacks		
Steamboat/ Sutter Complex	Prospect Island (2 & 3)						
		Subsided Island Reversal (24)					
	Levee Sebacks Sutter and Steamboat Sloughs (3)						
North Main Stem Sacramento River	New Diversion Point (pc) (29)						
Yolo Bypass/ Cache Slough Complex		Cache Slough (2)					
		Yolo Bypass (1)					
		Lindsay Slough (2)					
	Relocate North Bay Aqueduct (2)						
	Notch or Gate Fremont Weir (1)						
South Main Stem Sacramento River		Decker Island (10)					
		West Bank South of Rio Vista (9)					
Eastern Delta	Cosumnes River (7)						
	Levee Setbacks on North and South Forks of the Mokelumne (8)						
	Flood McCormack Island (5)						
	Partial Flooding of Staten Island						
	Flood Dead Horse Island (6)						
	Delta Cross Channel Operations (4)						
San Joaquin River		Dutch Slough (22)					
		Jersey Point (12)					
		Three-mile Slough (11)					
	Subsided Island Reversal (24)						
South Delta	South Delta Flood Bypass (16)						
		Old and Middle Rivers (13 & 14)					
	Union Island (17)						
	Roberts Island (18)						
	Subsided Island Reversal (24)						
	South Delta Exports (15)						
	Tidal Gates on Old and Middle River 24						
Suisun Bay	New York Slough/Antioch/Pittsburg Riverfront 23						
Suisun Marsh	Salinity Control Gates 25						
		Montezuma 19					
	Nurse Slough/Bialock 21						
	Grizzly, Chipps, Van Sickle, and Wheeler 27						
		Joice Island 28					
		Hill Slough 20					

Desirable Ecosystem Investments

Each investment option has different potential for addressing the general Moyle criteria for improving the Delta as a habitat for native estuarine fishes (Table 1 and Moyle et al. 2009). The Moyle criteria addressed by each investment are presented in Appendix A. These are used in our initial approach for evaluating potential investments, qualitatively (Tables 3 and 4).

...

Table 3a. Number of investments in Table 2 that satisfy the ecosystem criteria in Moyle et al. (2010, see Table 1)

	Ecosystem Component	Number of investments
1	Internal tidally mixed Delta flows	7
2	Slough networks	30
3	River inflows	3
4	Tidal marsh	27
5	Open water	4
6	Variable salinity	14
7	Increase abundance of native species	37
8	Floodplains	12
9	Water quality	12
10	Cooler summer habitats	3

Table 3b: Number of investments by broad habitat type

Habitat Type/Mitigation Action	Number of Investments
Flooded Island	4*
Tidal Marsh	24
Floodplain	10
Riparian	3
Water Operations	9

*In addition to flooded islands, subsided island reversal has been proposed. These ecosystem investments have not been incorporated into the flooded island score. Islands considered for subsidence reversal have been identified and will be shallow or deeply subsided (Bates and Lund 2009).

Table 4: Ecosystem investments options by location and number of Moyle criteria met

Location	Ecosystem Investment	Number of Criteria Met
Yolo Bypass/ Cache Slough Complex	Cache Slough	4
	Lindsay Slough	2
	Fremont Weir	1
	Yolo Bypass	3
	Removal of the North Bay Aqueduct	0
Steamboat/Sutter Slough Complex	Flood Prospect Island	5
	Levee setbacks on Steamboat Slough	5
	Levee setbacks on Sutter Slough	4
Eastern Delta	Levee Setbacks on North Fork of Mokelumne	4
	Levee Setbacks on South Fork of Mokelumne	4
	Flood McCormack Island	6
	Flood Dead Horse Island	6
	Flood Staten Island	6
	Cosumnes River Floodplain/Flows	6
	DCC Operations	2
North Main Stem Sacramento River	New water diversion point (PC)	3
South Main-stem Sacramento River	Decker Island	3
	Sherman Island	4
	West bank south of Rio Vista	3
San Joaquin River	Subsided Island Reversal	0
	Tidal Marsh Jersey Point	5
	Tidal Marsh Three-mile Slough	5
	Prescribed Flows	5
	Dutch Slough	3
South Delta	Subsided Island Reversal	0
	South Delta Exports	5
	Interim Tidal Gates Old River	1
	Interim Tidal Gates Middle River	1
	Levee setbacks/channel restoration on Old River	3
	Levee setbacks/channel restoration on Middle River	3
	Mitigation on Union Island	0
	Mitigation on Roberts Island	0
	South Delta Flood Bypass (Stewart Tract and Paradise Cut)	3
Suisun Bay	New York Slough/Antioch/Pittsburg riverfront	5
Suisun Marsh	Suisun Marsh Restoration	4
	Individual areas: Blalock, Wheeler, Van Sickle, Chipps, Grizzly, Joice Island, Hill Slough, Peytonia Slough, Montezuma	4
	Operation of the Salinity Control Gates	5

Table 5: Major local non-habitat benefits of potential habitat investments

Location	Ecosystem Investment	Major local non-habitat benefits
Yolo Bypass/ Cache Slough Complex	Cache Slough	Recreational Fishing, Bird watching, Eco-tourism, Scientific assessment
	Lindsay Slough	Recreational Fishing, Bird watching, Eco-tourism, Scientific assessment
	Fremont Weir	N/A
	Yolo Bypass	Bird watching, Eco-tourism, Scientific assessment
	Removal of the North Bay Aqueduct	N/A
Steamboat/ Sutter Slough Complex	Flood Prospect Island	Recreational Fishing, Bird watching, Eco-tourism, Scientific assessment
	Levee setbacks on Steamboat Slough	Recreational Fishing and Scientific Assessment
	Levee setbacks on Sutter Slough	Recreational Fishing and Scientific Assessment
Eastern Delta	Levee Setbacks on North Fork of Mokelumne	Recreational Fishing and Scientific Assessment
	Levee Setbacks on South Fork of Mokelumne	Recreational Fishing and Scientific Assessment
	Flood McCormack Island	Recreational Fishing, Bird watching, Eco-tourism, Scientific assessment
	Flood Dead Horse Island	Recreational Fishing, Bird watching, Eco-tourism, Scientific assessment
	Flood Staten Island	Recreational Fishing, Bird watching, Eco-tourism, Scientific assessment
	Cosumnes River Floodplain/Flows	Recreational Fishing, Bird watching, Eco-tourism, Scientific assessment
	DCC Operations	N/A
N. Main Stem Sacramento R.	New water diversion point (PC)	N/A
S. Main-Stem Sacramento River	Decker Island	Recreational Fishing, Bird watching, Eco-tourism, Scientific assessment
	Sherman Island	Recreational Fishing, Bird watching, Eco-tourism, Scientific assessment
	West bank south of Rio Vista	Recreational Fishing and Scientific Assessment
San Joaquin River	Subsided Island Reversal	N/A
	Tidal Marsh Jersey Point	Recreational fishing
	Tidal Marsh Three-mile Slough	Recreational Fishing, Bird watching, Eco-tourism
	Prescribed Flows	N/A
	Dutch Slough	Recreational Fishing, Bird watching, Eco-tourism
South Delta	Subsided Island Reversal	N/A
	South Delta Exports	N/A
	Interim Tidal Gates Old River	N/A
	Interim Tidal Gates Middle River	N/A
	Levee setbacks/channel restoration on Old River	N/A
	Levee setbacks/channel restoration on Middle River	N/A
	Mitigation on Union Island	Eco-tourism
	Mitigation on Roberts Island	Eco-tourism
	South Delta Flood Bypass (Stewart Tract and Paradise Cut)	Eco-tourism, Bird watching, Scientific assessment
Suisun Bay	New York Slough/Antioch/Pittsburg riverfront	Urban riverfront beautification, Recreational Fishing
Suisun Marsh	Suisun Marsh Restoration	Recreational Fishing, Bird watching, Eco-tourism, Scientific assessment
	Individual areas: Blalock, Wheeler, Van Sickle, Chipps, Grizzly, Joice Island, Hill Slough, Peytonia Slough, Montezuma	Recreational Fishing, Bird watching, Eco-tourism, Scientific assessment
	Salinity Control Gates Operation	Recreational Fishing, Bird watching, Eco-tourism, Scientific assessment

Conclusions

What is presented here is an approach to prioritizing ecosystem investments that can increase the value of investments made in improving Delta inflows and outflows. We see ecosystem investments of this kind listed here as fitting into an overall plan to make the Delta a place that favors desirable species and ecosystem services. We think that a prioritization scheme based on ecological benefits, when combined with others based on costs and additional benefits, could be put in place fairly rapidly and improve decision making for ecosystem investments. Such a process is necessary if we are going to prevent extinction of listed species and find ways to work with, rather than against, the inevitable physical and biological changes that are coming to the Delta.

Literature Cited (see reference section at end of Appendix A).

Acknowledgements

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Appendix A - Summary of Major Potential Ecosystem Investments

1. Name: Prospect Island

Location: Cache Slough Complex/Steamboat/Sutter Slough Complex

Aerial Extent:

Implementation Horizon: 1-3 years

Seasonality: Continuous

Annual Frequency: Continuous

Description: Prospect Island has flooded seven times since 1981, and has little value for agriculture (Reynolds, 1998 site assessment). Purposefully breaching and re-flooding Prospect Island could create beneficial habitat for Delta and migratory species. This island is immediately east of Cache Slough and the Yolo Bypass and could create refuge habitat for species of concern in the form of tidal marsh and shallow water habitat. Reclaiming this island as an ecosystem investment would also increase connectivity of heterogeneous habitat, to increase the size and health of the Cache Slough Complex and base of the Yolo Bypass. Additionally this area is just north of the confluence of the Sacramento River and Steamboat Slough. Outmigrating salmonids have been noted to follow the direction of the tide and move toward this region. Creating additional tidal marsh and shallow water habitat could improve survival for these fish by creating refuge habitat while they are holding.

References: Reynolds, 1998

2. Name: Subsided Island Reversal

Location: Delta-wide or location-specific

Aerial Extent: Variable

Implementation Horizon: Longer than 5 years

Seasonality: None

Annual Frequency: None

Description: Subsidence reversal involves shifting land from agricultural use to controlled marshland which slowly raises land elevations. Reversal is probably only viable for a few whole islands, but could be beneficial for sections of other islands. Subsidence reversal rate estimates are 4 cm/yr. The most promising islands and areas for subsidence reversals are either deeply subsided or have subsided relatively little. One concern for subsided island reversal is that levees protecting the projects will fail after they have reached the ideal depth zone for water weed invasion (between 1.5 and 4.6 meters depth). Lands subsided more than 4.6 meters below sea level will hinder water weed establishment due to inadequate light. For land less than 1.5m below sea level, tules can establish and presumably out-compete invasive water weeds and create habitat for native species. Islands in the deep category are Mandeville Island, Webb Tract, Empire Tract, Bouldin Island, McDonald Tract, and Bacon Island; and islands in the shallow category are Terminous Tract, Brack Tract, Grand Island, Canal Ranch Tract, Hotchkiss Tract, Roberts Island, Union Island, and Coney Island (Bates and Lund 2009). Roberts and Union Islands have been proposed as potential riparian zones next to a south Delta flood bypass, while Bacon Island and Webb Tract have been proposed potential water storage areas. Subsidence reversal in the shallow subsided islands could be beneficial in keeping up with sea level rise (Bates and Lund 2009).

References: Bates and Lund 2009

3. Name: Levee setbacks on Steamboat and Sutter Sloughs

Location: Steamboat/Sutter Slough Complex

Aerial Extent: Local to sloughs

Implementation Horizon: 3-5 years

Seasonality: Winter/Spring/Continuous

Annual Frequency: Permanent

Description: Levee setbacks on Steamboat and Sutter Sloughs would create additional riparian, floodplain, and tidal marsh. This would facilitate the re-working of soils and movement of the main channel. Levee setbacks must move back levees adequately. Moving levees back a small amount can have little to no measurable benefit (Chapin 1997). If agencies seek to encourage migratory fish to use this route rather than Georgiana Slough and the Delta Cross Channel (DCC) it is important to create a corridor of heterogeneous habitat. There are already areas of the levees with significant vegetation and tree growth. Setbacks in the proper areas could create small riparian and tidal marsh zones along this corridor.

References: Perry et al. 2009; Jeffres 2008; BDCP 2009

4. Name: New water diversion point (peripheral canal)

Location: North Mainstem Sacramento River

Aerial Extent: N/A

Implementation Horizon: Longer than 5 years

Seasonality: Summer

Annual Frequency: Yearly/++Dry years

Description: Construction of a new water diversion upstream on the Sacramento River would make for a cleaner and more reliable water supply. Drawing water from further upstream would allow south Delta pumping and Delta Cross Channel operations to be altered to be more beneficial to fisheries while still supplying urban and agricultural user with water (Moyle and Bennett 2008). A northern diversion point could help promote natural flow regimes and benefit south Delta ecosystem investments (BDCP 2009). Researchers believe that salmonids entrained into the central Delta typically exhibit lower survival than fish that utilize the main stem Sacramento River due to predation (Brandes pers. comm..).

References: BDCP 2009

5. Name: Cache Slough

Location: Cache Slough Complex

Aerial Extent: ~30,000 acres

Implementation Horizon: 1-3 years

Seasonality: Winter/Spring/Continuous

Annual Frequency: Continuous

Description: The Cache Slough area could support large areas of various habitat types in a dynamic region while promoting connectivity. The area is just south of the Yolo bypass and north of Steamboat Slough and the mainstem Sacramento River. There are strong tidally-driven flows and water elevations in this area and seasonal flows and habitat linked with the Yolo Bypass. This area is also the transition zone from floodplain, marsh, and slough habitats generally dominated by river flow to a deep, wide, tidally influenced region with little refuge area for fish. Ecosystem investments could improve up to 45,000 acres of habitat by creating

riparian, floodplain, tidal marsh, and open water areas for species of concern in the Delta (Kirkland, 2008 (Interim Delta Actions). Much baseline scientific work has been conducted in this area (Sommer et al. 2004, Sommer et al. 2004, Kirkland 2008) and this ecosystem investment could be ideal for scientific evaluation of actions, creating a stronger scientific basis for future actions.

References: Sommer et al. 2004, Sommer et al. 2004, Kirkland 2008, Aasen 1999, DWR, BDCP 2009

6. Name: Yolo Bypass

Location: Cache Slough Complex

Aerial Extent:

Implementation Horizon: 1-3 years

Seasonality: Winter/Spring/Continuous

Annual Frequency: Yearly/++Wet Years

Description: The Yolo Bypass has great potential to create a vast area of floodplain habitat and act as a nutrient, productivity, and food source for the Delta. Many studies support the idea that the bypass could benefit native species of concern in the Delta. Ecosystem investment in the bypass would connect areas of importance and act as a refuge and nursery for many aquatic and avian species. Management of flows through the bypass will determine the size of the area inundated and residence time of the water, which will affect primary production and transport to adjacent habitats. The bypass will need to be inundated under an appropriate seasonal regime to deter establishment of undesirable species.

References: Lehman et al. 2008; Benigno 2008; Feyrer et al. 2006, 2006b, 2004; Sommer et al. 2004, Sommer et al. 2001a, 2001b; Schemel et al. 2004; Jeffres 2008; BDCP 2009

7. Name: Lindsey Slough

Location: Cache Slough Complex

Aerial Extent: 138 acres

Implementation Horizon: 1-3 years

Seasonality: Winter/Spring/Continuous

Annual Frequency: Continuous

Description: Investment in this slough will increase habitat availability and heterogeneity within the Cache Slough complex. Reclaiming diked wetlands in this area would create freshwater tidal marsh for fish and birds. The open water habitat within this slough has not been colonized by dense invasive aquatics and this area is important to species of concern such as delta smelt (USFWS, 1996; Bennett, 2005; SLT 2006). It would also be desirable to create floodplain connectivity with this habitat (SLT, 2006).

References: USFWS, 1996; Bennett, 2005; SLT 2006

8. Name: Relocation of North Bay Aqueduct

Location: Cache Slough Complex

Aerial Extent: N/A

Implementation Horizon: 1-3 years

Seasonality: N/A

Annual Frequency: N/A

Description: The North Bay Aqueduct currently diverts much of the water entering Barker Slough. The net flow can run backwards and directly affect entrainment of larvae and reduce the organic carbon and nutrients that may otherwise be transported to the Delta. Movement of the Aqueduct could improve the survival of larval fish and food supply for the region. The aqueduct was constructed to deliver water to users in Solano and Napa Counties and currently does not deliver the contracted amount of water to the users (GEI Consultants, 2009) and provides poor quality water for local drinking water treatment plants (Bookman Edmonston 2003). There are currently pumping restrictions on the North Bay Aqueduct to protect delta smelt.

References: Edmonston 2003 and GEI Consultants 2009

9. Name: Notch/Gate Fremont Weir

Location: Cache Slough Complex/North Mainstem Sacramento

Aerial Extent: 1,461 acres

Implementation Horizon: 1-3 years

Seasonality: Winter/Spring

Annual Frequency:

Description: Notching or putting a gate on the Fremont Weir is essential for managing the Yolo Bypass for fish. Installing a gate would allow managers to introduce variation to the bypass at desired times and intervals. Inundating the bypass at proper times will create habitat on the Yolo Bypass which will hopefully also fuel other areas of the Delta (BDCP 2009).

References: Feyrer 2006, BDCP 2009

10. Name: Decker Island

Location: South Mainstem Sacramento River

Aerial Extent:

Implementation Horizon: 1-3 years

Seasonality: Continuous

Annual Frequency: Continuous

Description: Creation of tidal marsh on eastern Decker Island will help create refuge habitat and connectivity between other ecosystem investments within the region, especially Three-mile Slough and Jersey Point tidal marsh areas. Additionally this area is relatively well sheltered and has the potential for positive feedback.

References: DWR Interim Actions

11. Name: West bank south of Rio Vista

Location: South Mainstem Sacramento River

Aerial Extent:

Implementation Horizon: 1-3 years

Seasonality: Continuous

Annual Frequency: Continuous

Description: The west bank south of Rio Vista is currently a sandy shallow water habitat. There are occasional isolated tree islands as you approach the area opposite of Decker Island. This location could be ideal for re-establishing tidal marsh along the margins of the Sacramento River and could provide valuable refuge for outmigrating fish or species moving from the Cache Slough/Yolo Bypass Complex.

References: BDCP 2009, Ganju et al. 2005, Hammersmark et al. 2005, Jassby and Cloern 2000

12. Name: Cosumnes River

Location: Eastern Delta

Aerial Extent:

Implementation Horizon: 1-3 years

Seasonality: Winter/Spring

Annual Frequency: Yearly

Description: The Cosumnes River Preserve already protects a section of this river, but additional investment in this area will facilitate fisheries recovery and the creation of more naturalized habitat which will also aid flood control in the eastern Delta.

References: Jeffres et al. 2008, Trowbridge 2007, Ahearn et al. 2006, Florsheim et al. 2006, Ribeiro et al. 2004, Florsheim and Mount 2003

13. Name: Levee setbacks on North and South Fork of the Mokelumne

Location: Eastern Delta

Aerial Extent:

Implementation Horizon: 1-3 years

Seasonality: Continuous

Annual Frequency: Continuous

Description: Levee setbacks on the North and South Forks of the Mokelumne River would help create additional floodplain or bench habitat as well as tidal marsh beneficial for Delta flora and fauna. Such an investment coupled with flooding of select Delta islands in the eastern Delta would facilitate flood control in the eastern Delta and create a naturalized corridor of habitat for native species before reaching the interior Delta.

References: NDFM & ERP (DWR) 2008

14. Name: McCormack-Williamson Tract

Location: Eastern Delta

Aerial Extent:

Implementation Horizon: Shovel ready

Seasonality: Winter/Spring/Continuous

Annual Frequency: Yearly

Description: This island is currently owned by The Nature Conservancy and has the potential to create significant amounts of tidal and shallow water habitat in addition to increase flood control below the Cosumnes and Mokelumne River.

References: Ganju et al. 2005, Hammersmark et al. 2005, Brown and Pasternack 2005, Brown and Pasternack 2004, Jassby and Cloern 2000

15. Name: Staten Island

Location: Eastern Delta

Aerial Extent:

Implementation Horizon: 1-3 years

Seasonality: Winter/Spring/Continuous

Annual Frequency: Yearly

Description: Completely or partially flooding Staten Island will create a considerable amount of habitat and also add flood mitigation to the Cosumnes/Mokelumne River area. Depending on the specific implementation, a variety of subtidal and supratidal habitat could be created here.

References: NDFM & ERP (DWR) 2008, Ganju et al. 2005, Hammersmark et al. 2005, Jassby and Cloern 2000

16. Name: Dead Horse Island

Location: Eastern Delta

Aerial Extent:

Implementation Horizon: Shovel ready

Seasonality: Winter/Spring/Continuous

Annual Frequency: Yearly

Description: Dead Horse Island is directly north of the forks of the Mokelumne River. It is a small island with little infrastructure and the levees protecting the island failed frequently. Breaching this island would create additional tidal freshwater marsh and floodplain habitat with some nominal flood mitigation. Creating productive habitat in this region is essential as many juvenile salmonids pass through this region either intentionally or unintentionally. Fish entrained by the Delta Cross Channel are sucked into Snodgrass Slough and towards the Mokelumne Forks and interior Delta. Additionally fish migrating from the Mokelumne and Cosumnes River must pass through this area.

References: Ganju et al. 2005, Hammersmark et al. 2005, Jassby and Cloern 2000

17. Name: Delta Cross Channel Operations

Location: Eastern Delta/North Mainstem Sacramento River

Aerial Extent: N/A

Implementation Horizon: Shovel ready

Seasonality: Summer/Continuous

Annual Frequency: Continuous

Description: If a new water diversion point was built in the north Delta, the Delta Cross Channel (DCC) could be operated to favor fisheries rather than diverting water toward the interior Delta. The question would be if the gate could be operated to benefit Mokelumne and Sacramento River fish at the same time. Additionally operation of the DCC affects the water quality of the north, central, and south Delta and could raise salinities in the south and central Delta if not mitigated by strategic operation (BDGP 2009).

References: Brandes and McClain 2001, Perry et al. 2009

18. Name: Dutch Slough

Location: San Joaquin River

Aerial Extent: 1, 200 acres

Implementation Horizon: 1-3 years

Seasonality: Continuous

Annual Frequency: Continuous

Description: PWA has developed a restoration plan for 1200 acres in the Dutch Slough area to create tidal marsh, riparian, and coastal dune habitat (PWA 2003). This investment will create more tidal marsh in a transition zone for fisheries where they are beginning to leave the sloughs of the Delta and work their way towards the bays and greater tidal influence. This area could

create additional refuge habitat for fisheries whose movements are heavily influenced by the tides.

References: Ganju et al. 2005, Hammersmark et al. 2005, Jassby and Cloern 2000, Dutch Slough EIR 2008

19. Name: Jersey Point

Location: San Joaquin River

Aerial Extent:

Implementation Horizon: 1-3 years

Seasonality: Continuous

Annual Frequency: Continuous

Description: Jersey Point on the San Joaquin River has been suggested for tidal marsh restoration (BDCP Plan 2009). There is already aquatic vegetation on the western shore, however, the eastern shore is an armored levee comprised of bare rock. A large amount of barge traffic passes through this region and occasionally moors in the area, hence the depth and width of the channel. Many Central Valley migratory fish species will pass through the Jersey Point area on their way to and from the sea, including green sturgeon, white sturgeon, Chinook salmon, steelhead trout, or striped bass. Tidal marsh in this area could also benefit life history stages of these and resident species. Proposed by BDCP 2009.

References: Ganju et al. 2005, Hammersmark et al. 2005, Jassby and Cloern 2000, BDCP 2009

20. Name: Three-mile Slough

Location: San Joaquin River

Aerial Extent:

Implementation Horizon: 1-3 years

Seasonality: Continuous

Annual Frequency: Continuous

Description: Three-mile Slough is a short slough connecting the Sacramento and San Joaquin Rivers. The slough connects to the San Joaquin River north of Jersey Point, and connects to the Sacramento River on the north side of Decker Island. Creating tidal marsh in this area could be particularly important for providing connectivity within the region and being a refuge for native species. Proposed by BDCP 2009.

References: Ganju et al. 2005, Hammersmark et al. 2005, Jassby and Cloern 2000, BDCP 2009

21. Name: South Delta flood bypass

Location: South Delta

Aerial Extent:

Implementation Horizon: 3-5 years

Seasonality: Winter/Spring

Annual Frequency: Yearly/++Wet years

Description: Creation of a south Delta Bypass would create flood control while providing rearing habitat for young salmonids leaving the San Joaquin watershed in addition to benefiting other local fish species. The floodplain would also increase habitat connectivity and facilitate seasonal and interannual variation. Additionally the floodplain would increase primary production and have potential to provide food and nutrients for the southern Delta in late winter and early spring.

References: Jeffres 2008; Sommer 2001

22. Name: Old and Middle Rivers

Location: South Delta

Aerial Extent:

Implementation Horizon: 1-3 years

Seasonality: Continuous

Annual Frequency: Continuous

Description: Creation of tidal marsh/channel restoration, riparian zone and levee setbacks have been proposed for both Old and Middle Rivers. Proposed by BDCP 2009.

References: Ganju et al. 2005, Hammersmark et al. 2005, Jassby and Cloern 2000, BDCP 2009

23. Name: Union Island

Location: South Delta

Aerial Extent:

Implementation Horizon: 3-5 years

Seasonality: Continuous

Annual Frequency: Continuous

Description: This area has been proposed as a riparian zone ecosystem investment. Located in the southeastern Delta this riparian zone could potentially flank a south Delta flood bypass created along Paradise Cut.

References: BDCP 2009

24. Name: Roberts Island

Location: South Delta

Aerial Extent:

Implementation Horizon: 3-5 years

Seasonality: Continuous

Annual Frequency: Continuous

Description: This area has been proposed as a riparian zone ecosystem investment. Located in the southeastern Delta this riparian zone could potentially flank a south Delta flood bypass created along Paradise Cut.

References: BDCP 2009

25. Name: Curtail South Delta Exports

Location: South Delta

Aerial Extent: N/A

Implementation Horizon: Shovel ready

Seasonality: Spring/Summer

Annual Frequency: Yearly

Description: Curtailing south Delta exports will decrease the cross Delta flows thought to be troublesome for many fish species. It will also reduce the number of fish from the south Delta entrained at the pumping facility

References: OCAP BA 2008

27. Name: New York Slough/Antioch/Pittsburg Riverfront

Location: Suisun Bay

Aerial Extent:

Implementation Horizon: 1-3 years

Seasonality:

Annual Frequency: Little

Description: This area has been heavily developed and much of this region is flanked by urban or industrial areas. New York Slough has several large marinas (two in Pittsburg and Antioch) and a large ship dock area on the south shore. There is a power plant located just west of New York Slough directly south of Chipps Island. Creating additional habitat in this area is important as many fish species are affected by the flows and move back and forth with ebb and flood tides. This area is a transition zone from a rip-rapped and channelized delta to more of an open water estuary.

References: Ganju et al. 2005, Hammersmark et al. 2005, Jassby and Cloern 2000, BDCP 2009

28. Name: Montezuma Slough Salinity control gate operations

Location: Suisun Marsh

Aerial Extent: N/A

Implementation Horizon: Shovel ready

Seasonality: Continuous

Annual Frequency: Continuous

Description: The salinity control gates are already in place, but reoperation of the gates to benefit the flora and fauna of the Delta and Suisun Marsh may be possible. The gates could be used to alter the salinity to benefit desirable species. Ideally this option coupled with other ecosystem investments would help tip the scales in the proper direction.

References: N/A

29. Name: Suisun Marsh

Location: Suisun Marsh

Aerial Extent:

Implementation Horizon: 1-3 years

Seasonality: Continuous

Annual Frequency: Continuous

Description: Strategic purchase of duck clubs, Meins Landing, Blacklock Island, Grizzly Island, Joice, Island, Wheeler Island, Van Sickle Island, Chipps Island, Hill Slough, Peytonia Slough, Montezuma Slough. Breaching the small earthen dikes within Suisun Marsh will introduce variability, salinity, tidal processes, and hopefully native fauna. Connecting the diked wetlands will promote habitat connectivity and exchange between what will soon be tidal marsh and adjacent sloughs. Many studies have examined the effect of slough features and fish assemblages/abundances (Meng 1994; Matern et al. 1997, 1998, 1999, 2002; Suisun Marsh Ecological Workgroup 2001). Larger sloughs are typically more heavily utilized by seasonal species, but smaller sloughs were home to larger abundances of native species (Meng 1994). The Suisun Marsh Ecological workgroup found the highest diversity and abundances of fish species in a small slough with undiked tidal wetlands located in Suisun Marsh. Aspects proposed by BDCP 2009.

References: Meng 1994; Matern et al. 1997, 1998, 1999, 2002; Suisun Marsh Ecological Workgroup 2001

30. Name: Sherman Island
Location: South Mainstem Sacramento River
Aerial Extent:
Implementation Horizon: Shovel Ready
Seasonality: Continuous
Annual Frequency: Continuous
Description:
References: Aasen 1999, NHI 2002

31. Name: Moveable Gates
Location: South Delta
Aerial Extent: South Delta
Implementation Horizon: Shovel Ready
Seasonality: Summer
Annual Frequency: Yearly/++Dry Years
Description: Two moveable gates would be seasonally installed along Old and Middle Rivers to facilitate water operations without the creation of net flows drawing fish toward the pumping facility. Proposed in BDCP 2009.
References: 2 Gates fish protection demonstration project

32. Name: Webb Tract
Location: Mainstem San Joaquin River
Aerial Extent:
Implementation Horizon: 1-3 years
Seasonality: Continuous
Annual Frequency: Continuous
Description: This island will be used as a water storage facility. It also has the potential to be utilized as a rearing habitat for species requiring open water habitat. Such an investment meets the needs of improving water supply while potentially assisting species of concern in the Delta. If the flooded island were to become inhabited by invasive species it could easily be drained and repopulated with desirable species again.
References: DWR

33. Name: Bacon Island
Location: Mainstem San Joaquin River
Aerial Extent:
Implementation Horizon: 1-3 years
Seasonality: Continuous
Annual Frequency: Continuous
Description: This island will be used as a water storage facility. It also has the potential to be utilized as a rearing habitat for species requiring open water habitat. Such an investment meets the needs of improving water supply while potentially assisting species of concern in the Delta. If the flooded island were to become inhabited by invasive species it could easily be drained and repopulated with desirable species again.
References: DWR

34. Name: Sacramento Wastewater Treatment Facilities

Location: North Mainstem Sacramento River

Aerial Extent:

Implementation Horizon: 1-3 years

Seasonality: Continuous

Annual Frequency: Continuous

Description: Increase treatment levels for the Sacramento Metropolitan wastewater treatment plant. Contamination of Sacramento River water is a major issue for the Delta. Effluent from waste water treatment plants has higher than desirable levels of pollutants.

References: Dougdale et al. 2007

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Location	Investment Type						
	Habitat Type (by sea level)					Water Operations	Other
	Flooded Island	Tidal Marsh	Floodplain	Riparian	Levee Setbacks		
Steamboat/ Sutter Complex	Prospect Island	-	-	-	Sutter & Steamboat Sloughs	-	Subsided Island Reversal
North Main Stem Sacramento River	-	-	-	-	-	New diversion point (pc)	-
Yolo Bypass/ Cache Slough Complex	-	Cache and Lindsay Slough	-	-	-	Fremont Wier	-
	-	Yolo Bypass	Yolo Bypass	-	-	Relocate N. Bay Aqueduct	-
South Main Stem Sacramento River	-	Decker Island and West bank South of Rio Vista	-	-	-	-	-
Eastern Delta	Dead Horse, McCormack, & Staten Is.	-	Cosumnes River	-	N. and S. forks of the Mokelumne	Delta Cross Channel Operations	Subsided Island Reversal
San Joaquin River	-	Dutch Slough, Jersey Point, & Three-mile Sl.	-	-	-	-	Subsided Island Reversal
South Delta	-	Tidal Marsh on Old and Middle Rivers	South Delta Flood Bypass	Union & Roberts Islands Old & Middle Rivers	-	South Delta exports	Subsided Reversal, Tid Gates Old & Middle River
Suisun Bay	-	New York Slough/Antioch/Pittsburg Riverfront	-	-	-	-	-
Suisun Marsh	-	Hill Slough, Blalock, and Montezuma	-	-	-	Salinity Control Gates	-

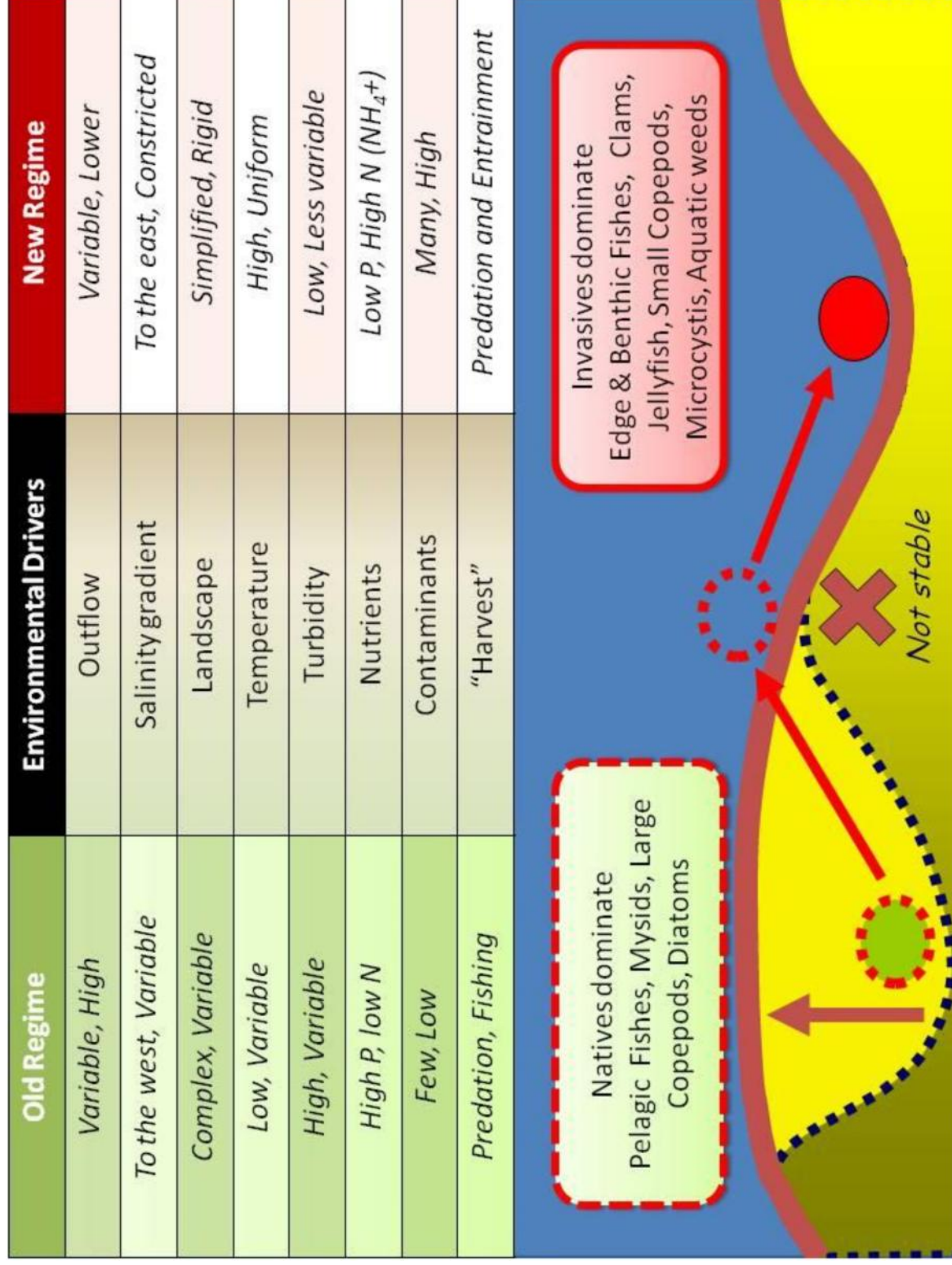


Figure 8. The ecological regime shift in the Delta results from changes in (slow) environmental drivers that lead to profoundly altered biological communities and, as soon as an unstable threshold region is passed, a new relatively stable ecosystem regime.

A Sorting of Delta Stressors

By Robert Pyke

A: The first order factors

1. Climate variability (including both the magnitude of winter and spring freshwater pulses and oceanic conditions) – out of our hands.
2. Flow regime – we have some but not complete control (reservoir operations, upstream diversions and conveyance/pumping operations)

B: Landscape

1. Connectivity
2. Complexity
3. Variability

Have all been altered by man – limited opportunities to reverse course.

C: The second order factors (which are mostly a function of A and B, not really independent unless you want to physically stir up turbidity or construct salinity control barriers)

1. Salinity
2. Temperature
3. Turbidity
4. Natural nutrients

D: Introduced Gunk (should all be eliminated – you use the waters of the state, you return them to the river in the same condition)

1. Unnatural nutrients
2. Contaminants
3. Disease?

E: Harvest (should be eliminated or at least tightly controlled)

1. Entrainment
2. Predation
3. Fishing?

From: [Leonard Lloyd](#)

Sent: Thursday, January 27, 2011 3:32 PM

To: [Ullrey, Nancy](#)

Subject: Interim Strategic Plan Public Comment

I appreciate the amount of work and intelligent thought that clearly went into this plan.

I have one concern. The requirement that the strategic plan be "consistent" with other efforts seems too restrictive. Perhaps a requirement that the other plans be considered explicitly would not only provide the latitude the Delta Conservancy needs, but would also be more informative as well.

thank you for ensuring that the interim plan achieves wide distribution.

Leonard Lloyd

1851 Gateway Drive

Oakley, CA 94561-2620

FEED BACK:

JANUARY 28, 2011

I attended the recent Delta Stewardship Council workgroup meetings in Chico, California

At the close of the January 25, 2011 meeting I spoke with the councilman that commented on the issues that were brought to the attention of the council. He informed me that the problem with many of us that we did not want change.

I and others attendees came to the conclusion that this Council was mandated to listen to us and had already made up their minds due to the numerous studies and they were on a mission to take whatever legal means to divert water from the Northern State to the Delta area. Many local community members were well informed on their water rights and how devastated our area would be if our ground water was diverted to save the Delta or increase the water to preserve the marsh land in the Delta.

Our area needs water for our agriculture ...the largest income in Butte County. The aquifer is a mystery to all who have studied it. Our local well drillers are aware of the decline of water due to draught and usage in the areas they service. They are united in stating do not let the State increase the amount of water shipped South of Sacramento or we will become a desert as other parts of our State all due to poor government management..

Please listen to the locals that farm and have for generations. Remember the Delta was all salt water to begin with. Due to poor decisions in the year past is why we are in the mess were in.

Do not make more mistakes because of a proposed fix to our past and permanently damage the Northern California agriculture industry. We have already regulated and devastated our lumber, dairies and cattle industry.

STATED ON THE FRONT COVER OF DELTA STEWARDSHIP HANDOUT.....

**MOVING FORWARD TO ADOPT A LEGALLY ENFORCEABLE DELTA PLAN
NECESSARY TO ACHIEVE THE COEGUAL GOALS...**

defined: this shall be achieve in a manner that protects and enhances the unique culture, recreation, natural resource and agricultural values of the DELTA.

**WHAT ABOUT THE CULTURE, NATURAL RESOURCE AND AGRICULTUAL VALUES
OF THE SACRAMENTO VALLEY?**

Respectfully,

Joan C. Townsend, 75 yr resident of No California

32 East Rio Bonito Rd

Oroville, Ca 95965

My Concerns:

January 28, 2011

- Take away water- rights replace with contracts. Do we know logistics of that stretch, pull and shove to break the contract?
- Take over water shed, streams, springs, rivers and ground waters (Aquifer) Run water to excess down and out to sea in the premise to save the fish. delta smelt, stripped bass, salmon and steelhead until they are found to be non- native species. Then switch to another.
- Letting excess cold water down through the /Delta having serious effect on the entire Delta eco-system, grasses, fish, animals etc with no regard.
- And you would add 3/4 more water transfer with no regard to upstream vegetation, animals, fish agricultural crops or people's livelihood.
-

Example:

Cold water will not allow algae to grow that the Delta smelt eat causing their demise.

Is this being done:

- Just to prevent Oroville Lake from becoming usable to recreation as was promised by Department of Water Resource when built.... maybe?

While you consider the information gathered, please look at the aquifers, damaged from over development in agriculture and domestic use in the Delta area and South..

Build your desalination units that are quite adequate and economic.

James H. Townsend

32 East Rio Bonito Rd, Biggs, Ca 95917

530 868 5520



**CONTRA COSTA
WATER DISTRICT**

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Concord, CA 94524
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February 1, 2011

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Vice President

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Jerry Brown
General Manager

Nancy Ullrey
Sacramento-San Joaquin Delta Conservancy
3500 Industrial Blvd., 2nd Floor
West Sacramento, CA 95691

Re: Delta Conservancy Interim Strategic Plan

Dear Ms. Ullrey:

Contra Costa Water District (CCWD) appreciates this opportunity to comment on the Sacramento-San Joaquin Delta Conservancy (Conservancy) Interim Strategic Plan (Plan). CCWD supports the Conservancy in its efforts to restore the Delta ecosystem and protect the economic and cultural resources of the Delta. CCWD offers the following comments regarding the water quality and funding aspects of the Conservancy's Plan:

One of the Conservancy's mandates is to protect and improve water quality, and CCWD applauds the Conservancy's long-term objective to provide outreach to protect and improve water quality (page 44, line 25) and the near-term strategy of "assist[ing] Delta residents and local entities in identifying, promoting, and communicating water quality needs and issues in the California Water Plan process" (page 45, lines 1-3). The Delta is an important source of drinking water for over 23 million Californians, and protecting this beneficial use requires protection of drinking water quality.

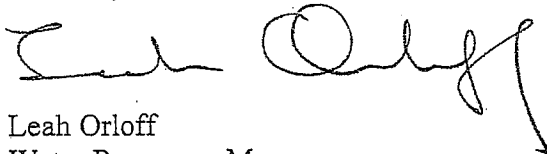
Ecosystem restoration, particularly if combined with the construction of an isolated facility as currently proposed in the Bay-Delta Conservation Plan, has the potential to adversely impact Delta water quality. For most of the year, the San Joaquin River primarily consists of agricultural drainage, which has high levels of selenium, pesticides, and salt. San Joaquin River flow is generally insufficient to meet current south Delta agricultural water supply demands and, if land currently used for agriculture is replaced with tidal marsh habitat, will certainly be insufficient to meet wetland water needs. The south Delta is also subject to discharges from urban and agricultural areas that add to this pollutant load. Relocating State Water Project and Central Valley Project exports to the north Delta will decrease Sacramento River flows into the Delta and increase residence times in the south Delta, leading to increased pollutant concentrations and salinity and potentially leading to bioaccumulation of toxics. More flow and/or less drainage, with adequate supply to meet the added water needs of any wetland restoration areas, are needed to protect Delta water quality and avoid a stagnant, polluted south Delta that supports neither native fish nor other beneficial uses. Improved flows and reduced pollution must be a condition precedent before any isolated facility or any large-scale ecosystem restoration projects in the south Delta are approved or started.

Nancy Ullrey, Sacramento-San Joaquin Delta Conservancy
Delta Conservancy Interim Strategic Plan
February 1, 2011
Page 2

The Plan directs the Conservancy to "[e]xamine ways beneficiaries of the Delta Plan can contribute financing to the Conservancy's projects to meet its co-equal responsibilities" (page 37, lines 13-14). All beneficiaries of Delta improvements should pay for benefits received. There is a broad base of beneficiaries in the Delta, and project costs should be assigned appropriately to all beneficiaries, including state funding for broad public benefits. The California Urban Water Agencies prepared a table, attached, which identifies the range of Delta users who will benefit from various Delta improvements. To the extent that user fees are used to fund these improvements, the fees should be allocated to all beneficiaries in proportion to their benefits or impacts. Credit against costs should be included for those who currently contribute to restoration (for example, contributors to the Central Valley Project Improvement Act Restoration Fund) and those who have fully mitigated their impacts to fisheries.

If you would like to discuss these comments, please call me at (925) 688-8083 or Lucinda Shih at (925) 688-8168.

Sincerely,



Leah Orloff
Water Resources Manager

LHS

Attachment

cc: Cindy Messer, Delta Conservancy Interim Executive Director
Mary Piepho, Delta Conservancy Chair

Attachment: California Urban Water Agencies Table of Delta Users that Benefit from Delta Improvements

<i>Improvements:</i>	Broad Public	Drinking Water Suppliers	Agric- ultural Industry	Delta Com- munities	Trans- portation	Other Delta Infra- structure	Waste- water Discharges	Recreation and Tourism Industry	Commer- cial Fishing Industry	Building Industry
<i>Emergency Preparedness</i>	•	•	•	•	•	•	•	•	•	•
<i>Flood Control and Levee Improvements</i>	•	•	•	•	•	•	•	•	•	•
<i>Habitat Restoration & Ecosystem</i>	•	•	•	•	•	•	•	•	•	
<i>Water Quality Improvements</i>	•	•	•	•			•	•	•	
<i>Conveyance Programs</i>	•	•	•				•	•	•	
<i>Storage Projects</i>	•	•	•	•	•	•	•	•	•	•
<i>Water Conservation Programs</i>	•	•	•				•			•
<i>Wastewater Recycling Programs</i>	•	•	•				•			•
<i>Wastewater Treatment Improvements</i>	•	•	•	•			•	•	•	

ISP Public Comments from Central Delta Water Agency

From: Nomellini, Grilli & McDaniel PLCs [mailto:ngmplcs@pacbell.net]
Sent: Tuesday, February 01, 2011 12:59 PM
To: Ullrey, Nancy
Cc: Jherrlaw@aol.com; 'Dante Nomellini, Jr.'; 'Dean Ruiz'; tmz@talavera.us; michael.machado@ymail.com; 'Mel Lytle'; dwooten@sjgov.org; TRPD@aol.com; 'Brett Baker'
Subject: Delta Conservancy Interim Strategic Plan

Nancy: Attached are the comments on behalf of the Central Delta Water Agency. The supporting data for lack of water supply is in the attached submittal to the Delta Stewardship Council. The support on the overstatement for sea level rise is in the hyperlinks. DJN Sr
http://www.sepp.org/publications/NIPCC_final.pdf
www.nipccreport.org

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Rudy Mussi
Edward Zuckerman

COUNSEL

Dante John Nomellini
Dante John Nomellini, Jr.

February 1, 2011

Via email nancy.ullrey@deltaconservancy.ca.gov

Sacramento-San Joaquin Delta Conservancy
3500 Industrial Boulevard, 2nd Floor
West Sacramento, CA 95691

Re: Interim Strategic Plan

Dear Ladies and Gentlemen:

General Comment

Protection and preservation of Delta agriculture and other uses requires: 1) adequate levees, 2) a robust emergency response mechanism to immediately repair and restore levee and drainage systems in the event of failure, 3) good in-channel water quality, 4) an adequate supply with the recognized rights to divert from the channels for irrigation of crops, wildlife friendly agricultural practices, habitat and recreation, 5) recognized rights to drain the lands and discharge seepage, stormwater and irrigation return flows to the channels. The role of the Conservancy should be to facilitate the above by funding and supporting needed studies, improvements and adjusted regulatory programs.

Page 26 - Line 3 change to read "The Delta and Suisun Marsh are key links in the Pacific Flyway." The Delta's importance as critical wintering habitat for waterfowl is understated. The agricultural fields are an essential winter food source for hundreds of thousands of geese and ducks as well as a variety of other migratory birds.

Page 27 - Line 7. This is an incorrect statement. Change to read "Portions of the Delta lands are below sea level." Check the topographic maps to verify the sea level lines. Attached hereto is DWR's map showing the Delta lowlands and uplands. The lowlands are all those lands below five (5) feet above sea level. The area at or below sea level is much smaller than the area within the Delta lowlands.

Page 27 - Line 8 - the "locally built and maintained" statement suggests that more risk is associated with such levees. The risk associated with levees is more directly related to their intended level of protection. Project levees (those built by the USACE) fail quite often. Many are designed and built to provide a relatively low level of protection, i.e., ten (10) year, forty (40)

year, etc.

Suggested change - Lines 8 and 9 - "These levees are subject to varying risks of failure."

Page 29 Resource Challenges, Item 3. The word "increased" should be deleted. Should read "Excessive and increasing demand on existing water supplies." The current and past demand on existing Delta water supplies has exceeded the safe yield of the Delta watershed. The SWP failed to develop the five (5) million acre feet per year of supplemental supply from North Coast watersheds and yet the SWP continues to export water from the Delta. The plan was to develop such supply by the year 2000. See attached copy of comments submitted to the Delta Stewardship Council.

Page 31, Line 6. The plan provides: "The overwhelming scientific consensus is that the rate of rise will accelerate significantly over the coming decades." This is overstated. If you focus on the Golden Gate, the rise has been about seven (7) inches in the last 100 years and there is some question as to whether or not the trend has flattened. Suggested change: "level, and planning should anticipate some future rise in sea level." Perhaps the Conservancy can facilitate a truly independent evaluation and prediction. See hyperlinks. See pages 16-19 of NIPCC_final.pdf. Summary Report - Nature - Not Human Activity Rules the Climate. See also full report nipcc.report.org which is 880 pages.

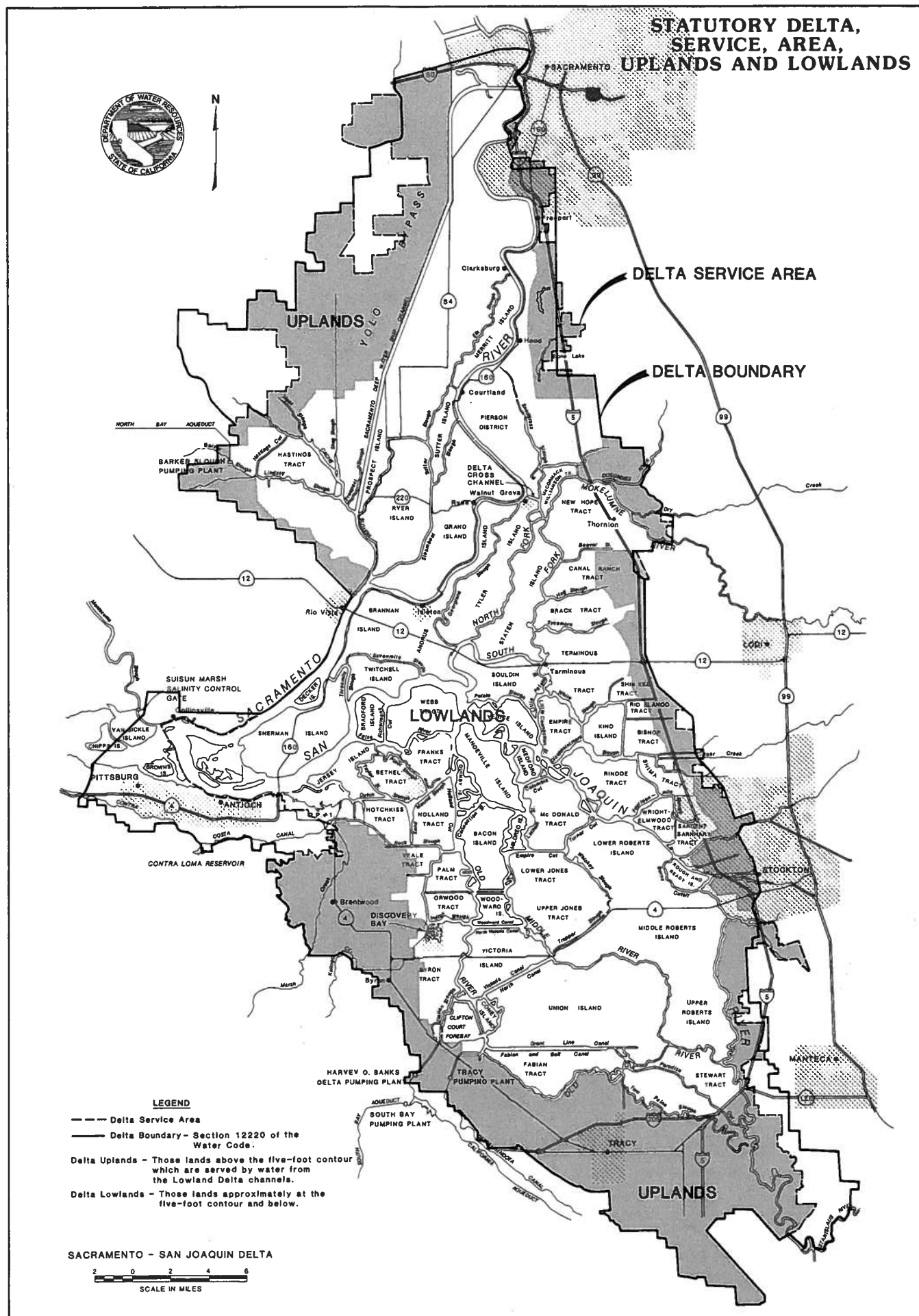
Page 46, Line 8. The date probably should be adjusted.

Yours very truly,



DANTE JOHN NOMELLINI
Manager and Co-Counsel

DJN:ju
Enclosures





CENTRAL DELTA WATER AGENCY

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DIRECTORS

*George Biagi, Jr.
Rudy Mussi
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COUNSEL

*Dante John Nomellini
Dante John Nomellini, Jr.*

January 28, 2011

Via email deltaplanscoping@deltacouncil.ca.gov

Ms. Terry Macauley
Delta Stewardship Council
980 Ninth Street, Suite 1500
Sacramento, CA 95814

Re: Notice of Preparation
Draft Environmental Impact Report for the Delta Plan

Dear Ms. Macauley:

Thank you for the opportunity to submit the following comments:

Project Objectives

To develop a plan to achieve the "Coequal goals" of "providing a more reliable water supply for California and protecting, restoring, and enhancing the Delta ecosystem" it is necessary to include an evaluation and recognition of the limited availability of water in the Delta watershed. CEQA allows a baseline which reflects current conditions. The SWRCB for D-1641 and CALFED for its Record of Decision used levels of exports in their baselines which are unsustainable. The result of course was an environmental document which did not appropriately reflect the unmitigated impacts to the environment and inflated the projected availability of water.

Surplus Water from the Delta Watershed Is Not Sufficient To Sustain Desired Levels of Exports

The planning for the State Water Project did not anticipate that the project would be operated after the year 2000 without five (5) million acre feet per year of supplemental water from North Coast watersheds. Attached hereto are the title page and excerpts from DWR's December 1960 Bulletin 76 report to the Legislature on the Delta Water Facilities. A complete copy of the Bulletin 76 report is being forwarded by separate email. The enlargements and highlights are mine. Exhibit A is the title page. Exhibit B is page 13 where it is shown that reduction in natural inflow due to upstream development and build-up in exports require the importation of the 5,000,000 acre feet from the north coast. Exhibit C is a blowup of the graph

from page 13. It shows the expected increase in demand and timing of the planned imports from the North Coastal Projects. Exhibit D is a blowup of the graph from page 11 which shows the timing and specific projects included in the plan. None of the North Coast Projects were constructed due in major part to wild at scenic river legislation and rejection of the Dos Rios project.

Attached hereto as Exhibit E is a copy of the hydrographs from page 116 of the Weber Foundation Studies titled "An Approach To A California Public Works Plan" submitted to the California Legislature on January 28, 1960. The highlights and margin notes are mine. Exhibit F includes pages 113 through 118 of the Weber Foundation Studies which explains the State Water Plan source of the data and adjustments.

The 1928/29-1933/34 six year drought period reflected on Exhibit E shows the average yearly runoff is 17.631 million acre feet with local requirements of 25.690 million acre feet. There is a shortage during the drought period within the Delta Watershed of 8.049 million acre feet per year without any exports. It is questionable whether the groundwater basins can be successfully mined to meet the shortage within the watershed let alone the export demands. A comparable review of the hydrograph for the North Coast area reflects that surplus water could be developed.

The hydrology supporting the State Water Project planning explains why the development of the North Coast Projects was deemed necessary to sustain the SWP exports. Current unimpaired flow determinations by DWR which are set forth in Exhibit G show an even greater shortage for the 1929-1934 drought in that the average unimpaired flow is only 13.12 million acre feet, not 17.631 million acre feet as used in the SWP planning. Exhibit G also reflects that for the 1987-1992 six year drought the average unimpaired flow was even lower, i.e., 12.71 vs. 13.12 million acre feet.

In addition to the lack of precipitation in the Delta watershed to meet local and export needs are the environmental needs. Water is needed for mitigation of project impacts and the affirmative obligations for salinity control and fish restoration.

The planning for the SWP and CVP underestimated the needs to protect fish both as to flow requirements and carryover storage required for temperature control. In 2009 after only two (2) dry years, the SWP and CVP violated the February outflow requirements claiming that meeting the outflow requirements would reduce storage below the point necessary to meet cold water requirements for salmon later in the year. Although they lied and the real reason for the violation was the ongoing pumping of the natural flow to help fill San Luis Reservoir, the incident clearly shows the inability of the projects to provide surplus water for export in the 4th, 5th and 6th years of a six-year drought. There is evidence that droughts longer than six years are possible.

Reliability of Water Supply Also Applies to the Water Needs Within the Delta and Other Areas of Origin.

In addressing the reliability of water supply for the purpose of export from the Delta, it must be recognized that the exports are limited to water which is truly surplus to the present and future needs of the Delta and other areas of origin and the affirmative obligations of the projects including provision of salinity control, an adequate water supply for the Delta and restoration of fish.

The cornerstones to the export of water from the Delta by the SWP and CVP are the promises and law that exports are limited to such surplus water.

Exhibit H includes the October 12, 1948, promise from Secretary of the Interior Krug that "There is no intent on the part of the Bureau of Reclamation ever to divert from the Sacramento Valley a single acre foot of water which might be used in the valley now or later." Exhibit I is a copy of Water Code section 11460 which codified the promises and made it clear that the application would be to the "watershed or area wherein water originates, or an area immediately adjacent thereto which can conveniently be supplied with water therefrom." Exhibit J includes the sections related to WC 11460. Not included is WC 11128 which applies WC 11460 and WC 11463 to any agency of the State or Federal Government undertaking construction or operation of the projects. Exhibit K is a copy of WC 11207 which provides that "Salinity control in the Sacramento-San Joaquin Delta" is a primary purpose of Shasta Dam. Exhibit L is a copy of the 1960 ballot argument in favor of the California Water Resources Development Bond Act which spawned the State Water Project. Of particular note are the following representations:

"No area will be deprived of water to meet the needs of another nor will any area be asked to pay for water delivered to another."

"Under this Act the water rights of Northern California will remain securely protected."

"A much needed drainage system and water supply will be provided in the San Joaquin Valley."

Exhibit M contains copies of Water Code sections 12200 through 12205 commonly referred to as the "Delta Protection Act." These sections added by Statutes of 1959 confirm the projects obligations to provide salinity control and an adequate water supply for the Delta.

WC 12204 provides that "In determining the availability of water for export from the Sacramento-San Joaquin Delta no water shall be exported which is necessary to meet the requirements of Sections 12202 and 12203 of this chapter." The requirements are salinity control and an adequate water supply. Exhibit N which is a copy of page 12 of the above-referenced Bulletin 76 interprets the Delta Protection Act.

“In 1959 the State Legislature directed that water shall not be diverted from the Delta for use elsewhere unless adequate supplies for the Delta are first provided.”

As related to the Peripheral Canal or Tunnels or any other isolated conveyance facility, the requirements of WC 12205 are particularly relevant.

“It is the policy of the State that the operation and management of releases from storage into the Sacramento-San Joaquin Delta of water for use outside the area in which such water originates shall be integrated to the maximum extent possible to permit fulfillment of the objectives of this part.” The objectives include salinity control and an adequate water supply. Conveyance facilities which transport stored water to the export pumps with no outlets or releases to provide salinity control and an adequate water supply in the Delta would not comply.

The export projects must fully mitigate their respective impacts. Failure to require such full mitigation is a shift of the cost of the project to someone else. The State Water Resources Development Bond Act was intended to preclude such a shift in costs. See also Goodman v. Riverside (1993) 140 Cal.App.3d 900 at 906 for the requirement that the costs of the entire project be paid by the contractors. Water Code section 11912 requires that the costs necessary for the preservation of fish and wildlife be charged to the contractors. The term “preservation” appears to be broader than mitigation and appears to create an affirmative obligation beyond mitigation.

Title 34 of Public Law 102-575 referred to as the Central Valley Project Improvement Act in section 3406(b)(1) authorizes and directs the Secretary of Interior to enact and implement a program which makes all reasonable efforts to ensure by the year 2002 natural production of anadromous fish (including salmon, steelhead, striped bass, sturgeon and American shad) will be sustainable on a long term basis at levels not less than twice the average levels attained during the period of 1967-1991.

Reliability of water supply for exports from the Delta should include a clear confirmation of the types and numbers of years when no water will be available for export and provide estimates of the amounts that might be available in other years. Care should be taken to model carryover storage with due consideration of temperature, flow and area of origin requirements to determine the firm yield available for export.

Protecting, Restoring and Enhancing the Delta Ecosystem Should Not Be Focused On Conditions Prior To Reclamation of the Delta.

The Delta Swamp and Overflowed Lands were fully reclaimed by about 1925. See Exhibit O from said above-referenced Bulletin 76. Due to subsidence of peat soils from oxidation, erosion, compaction and other causes, much of the land is below sea level and if

levees are breached or removed would become a waterbody with some riparian vegetation. Such a condition would on average evaporate or consume much more water than present uses. See Exhibit P.

Fish species in the Delta appeared to be doing well until the increase in SWP operations in the early and mid 1970's. See Exhibits Q, R, S and T. The CVPIA focus is on averages for 1967-1991. The most dramatic decline in fish species is more recent and includes the period from about 2000 to the present. The plight of the fisheries was recognized back when the striped bass index was recognized as the indicator for the environmental health of the Bay-Delta estuary. In 1978 the SWRCB found that "To provide full mitigation of project impacts on all fish species now would require the virtual shutting down of the project export pumps." See Exhibit U. The SWRCB also found that protection of Suisun Marsh would require an additional two (2) million acre feet of fresh water flow in dry and critical years. See Exhibit V. Exports were not shut down and the two (2) million acre feet was not provided for the Suisun Marsh. See Exhibit W.

In 1987 a review was made by Luna Leopold of the Rozengurt, Herz and Feld 1987 Analysis of the influence of water withdrawals on runoff to the Delta-San Francisco Bay ecosystem (1921-1983): Paul F. Romberg Tiburon Center For Environmental Studies, Tech. Rept. No. 87-7. The review reflected that use of the "Four River Index" rather than the total runoff into the Delta distorted the planning of the SWP and CVP and concluded that it was imperative to preclude any additional diversions of water from the Delta system. See Exhibit X. I will provide by separate email copies of the referenced analysis.

Additional Comments

The secondary planning area should include all of the southern portion of the State that could be potentially served with water from the Delta on the Colorado River, the interrelationship of the supply from the Colorado River to demands for exports from the Delta should not be ignored. The restructuring of water rights, measuring and reporting of surface and ground water and making water use inefficiency the equivalent of waste and unreasonable use are all tools which we believe will be used to destroy the water rights in the Delta and other areas of origin. Protection of such rights is critical to protection of the Bay-Delta watershed. The cost and expense of producing data which is of limited value is unjustified. Water use in the watersheds of origin is not wasteful in that flow into the Delta and into the usable underground is beneficial. Transfers outside of the watersheds of origin should be the focus of concern. The cornerstone of protection of the Delta is limiting exports to water which is truly surplus to the present and future needs of the Delta and other areas of origin including environmental needs. The SWP and CVP must not only mitigate their impacts in the Delta, upstream of the Delta (spawning habitat, cold water, etc.) and restore the San Joaquin River both as to fish and drainage from the CVP service areas on the west side, but must meet their affirmative obligations; to provide salinity control and an adequate water supply for the Delta; restore the natural production of anadromous fish

(including salmon, striped bass, sturgeon, etc.) to twice the 1967-1991 levels as required by the CVPIA and integrate to the maximum extent possible all releases from storage for export to provide an adequate water supply and salinity control for the Delta (WC 12205). We oppose isolated conveyance and support maintaining the common Delta Pool. We support self sufficiency and reduction in reliance on the Delta. Delta levees should be improved with a sufficiently funded locally managed levee program with a robust emergency response capability. South Delta permanent agricultural barriers should be installed with low lift pumps or the equivalent to provide adequate water quality and water levels. Channel improvements with dredging/setbacks in the south delta in the areas where export pumping greatly impacts water levels/sedimentation and in the north and south forks of the Mokelumne and the connections to the Delta cross channel should be evaluated. Features of the Delta corridors proposal and fish screens at the cross channel and export facilities should be evaluated. Operational control of the SWP and CVP should be given to an independent watermaster who is directed to and wants to protect the Bay-Delta watershed. Delta outflows should be restored with interconnections to Suisun Marsh. A determination should be made as to the present and future water needs including environmental needs within the Delta and other areas of origin and what water and under what conditions water is truly surplus and available for export. Restoration of habitat should be directed at the post reclamation condition with particular emphasis on outflow and the Suisun marsh. The Delta economy should not be destroyed to mitigate for export project impacts. Exports must be restrained to avoid such impacts. Without the 5 million acre feet of water per year that the SWP was supposed to develop from the north coast region by the year 2000 the water supply planned for export by the SWP does not exist. Similarly the water supply for the San Luis Unit was not supported by new development of yield. Planting of permanent crops dependent upon surplus water should be at the risk of those planting and the allocation of export water should be insulated from political management. Improvement of Paradise Cut with an intake farther upstream, channel improvements, and some levee setbacks should be evaluated. A diversion point west of the Delta should be evaluated. We oppose the BDCP proposed conversion of agricultural land to habitat and instead urge enhancement of the habitat of the in-channel berms and already flooded islands and cuts. Diversion and or spreading of flood water upstream of the Delta to recharge groundwater basins and provide flood control appears to have promise.

Your very truly

A handwritten signature in blue ink, appearing to read "Dante John Nomellin, Sr.", with a stylized, cursive script.

DANTE JOHN NOMEILLIN, SR.
Manager and Counsel

STATE OF CALIFORNIA
DEPARTMENT OF WATER RESOURCES

STATEMENT OF CLARIFICATION

This preliminary edition presents a comparison of alternative solutions to the Delta problem. This bulletin shows that the Single Purpose Delta Water Project is the essential minimum project for successful operation of the State Water Facilities. This bulletin also presents, for local consideration, optional modifications of the Single Purpose Delta Water Project which would provide additional local benefits.

The evaluation of project expenditures, benefits, costs, and costs of precast services, are intended only to indicate the relative merits of these solutions and should not be considered in terms of absolute values. Benefits related to recreation are evaluated for comparative purposes. Detailed recreation studies, presently in progress, will indicate specific recreation benefits.

Subsequent to local review and public hearings on this preliminary edition, a final edition will be prepared setting forth an adopted plan. The adopted plan will include, in addition to the assumed minimum facilities, those justifiable optional modifications requested by local entities.

Bulletin No. 76

REPORT TO THE
CALIFORNIA STATE LEGISLATURE

ON THE

DELTA WATER FACILITIES

AS AN INTEGRAL FEATURE OF

THE STATE WATER RESOURCES DEVELOPMENT SYSTEM

John A. Wilson

EDMUND G. BROWN
Governor

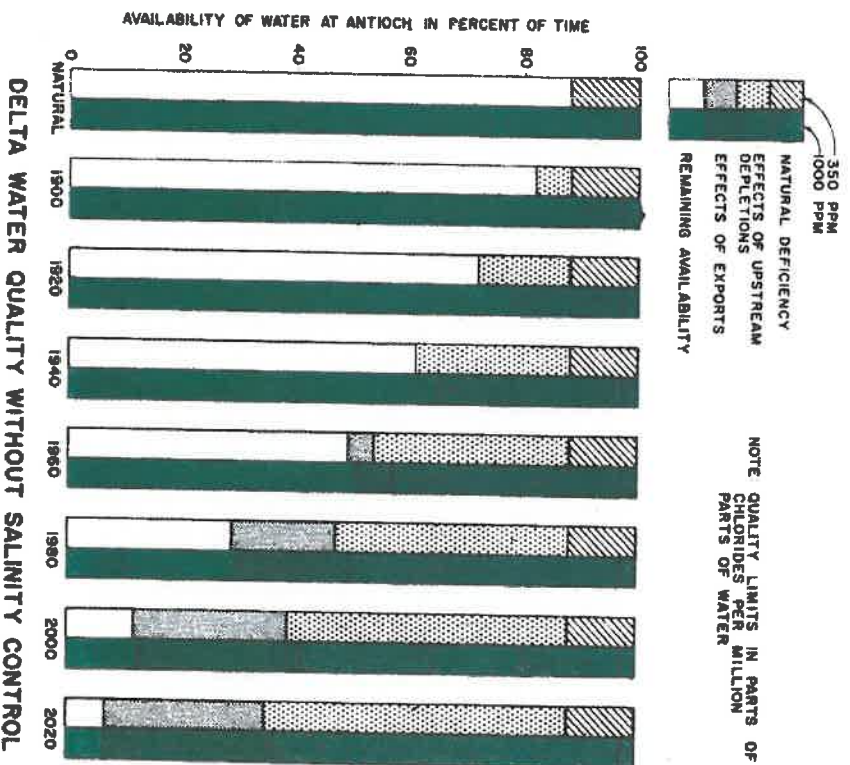
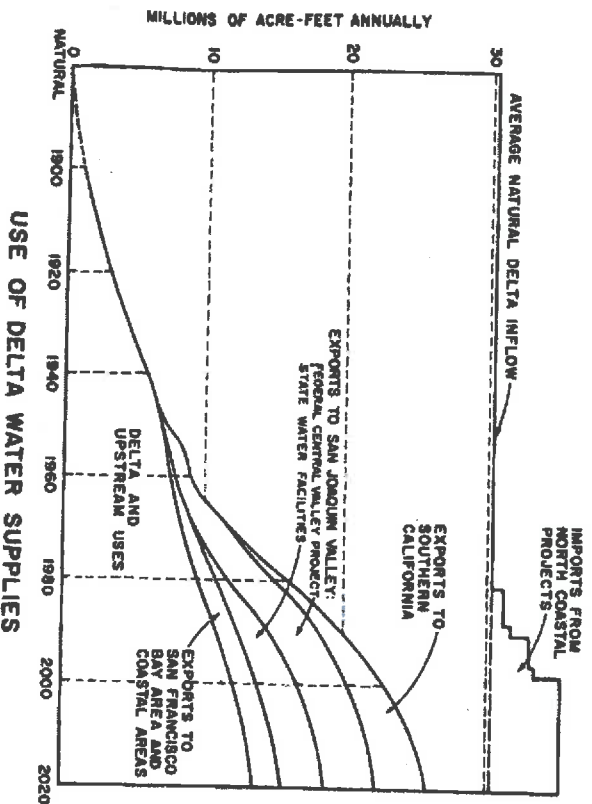


December, 1960

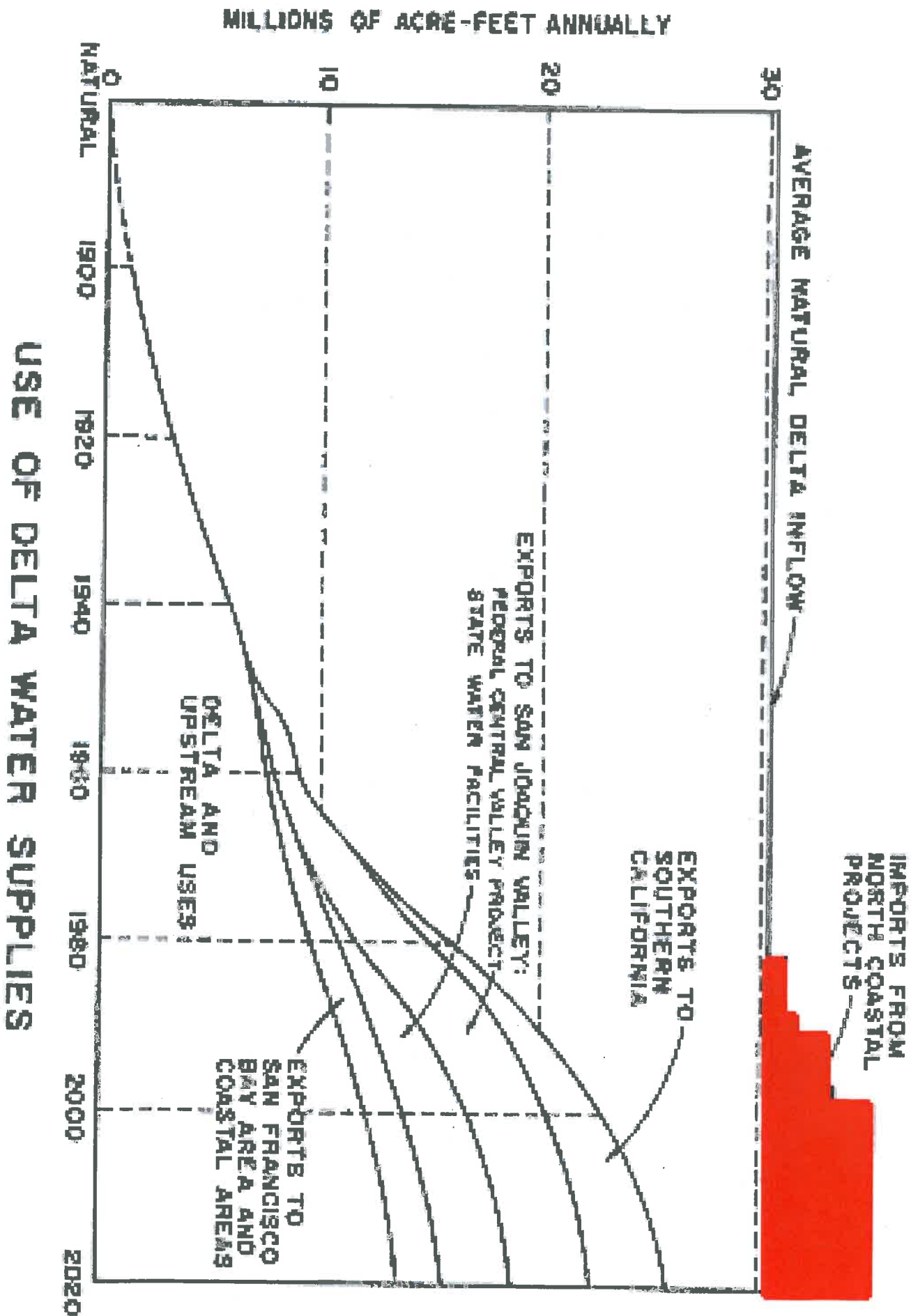
HARVEY O. BANKS
Director

EXHIBIT A

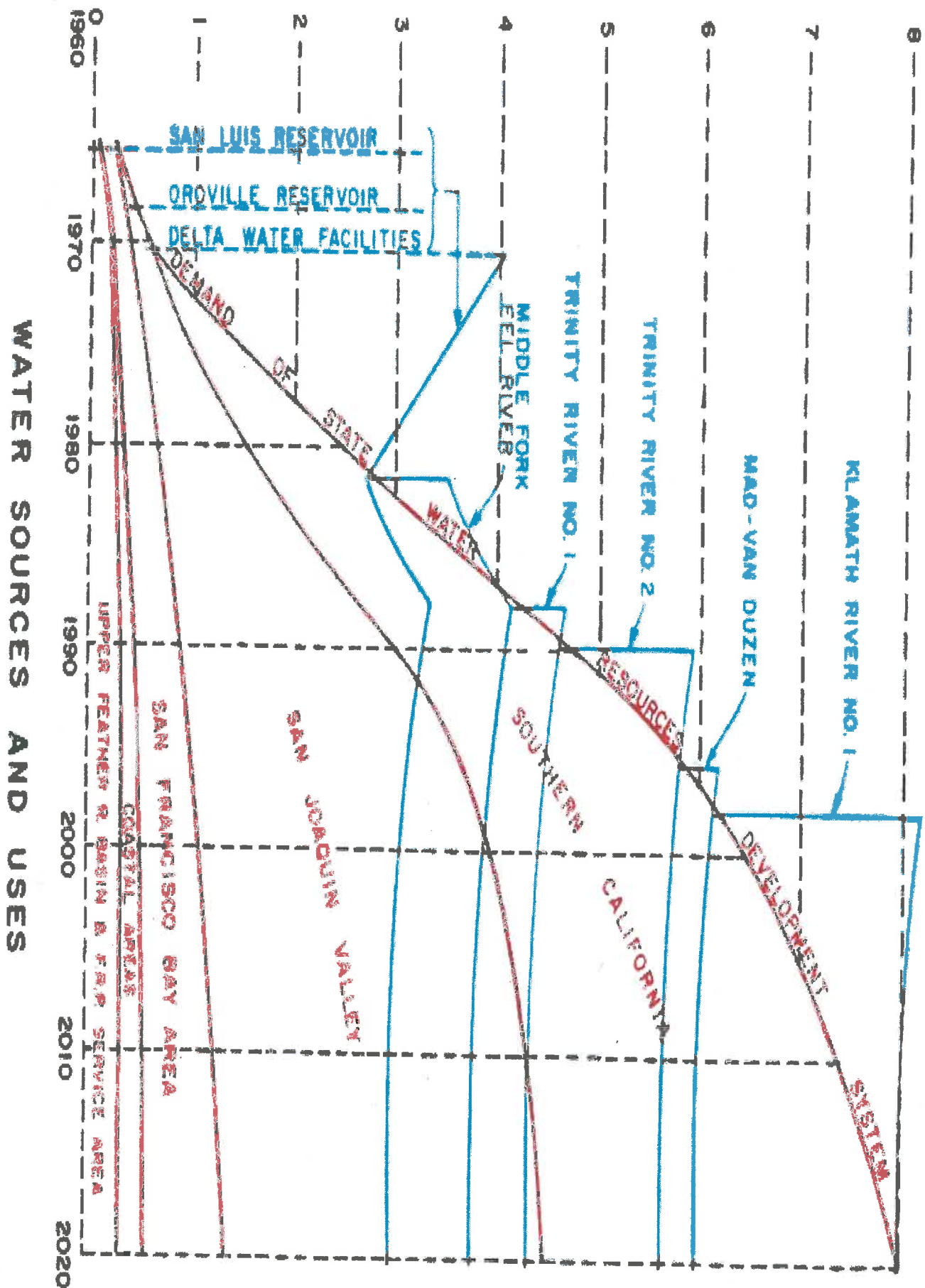
The natural availability of good quality water in the Delta is directly related to the amount of surplus water which flows to the ocean. The graph to the right indicates the historic and projected availability of water in the San Joaquin River at Antioch containing less than 350 and 1,000 parts chlorides per million parts water, under long-term average runoff and *without* specific releases for salinity control. It may be noted that even under natural conditions, before any significant upstream water developments, there was a deficiency of water supplies within the specified quality limits. It is anticipated that, without salinity control releases, upstream depletions by the year 2020 will have reduced the availability of water containing less than 1,000 ppm chlorides by about 60 percent, and that exports will have caused an additional 30 percent reduction.



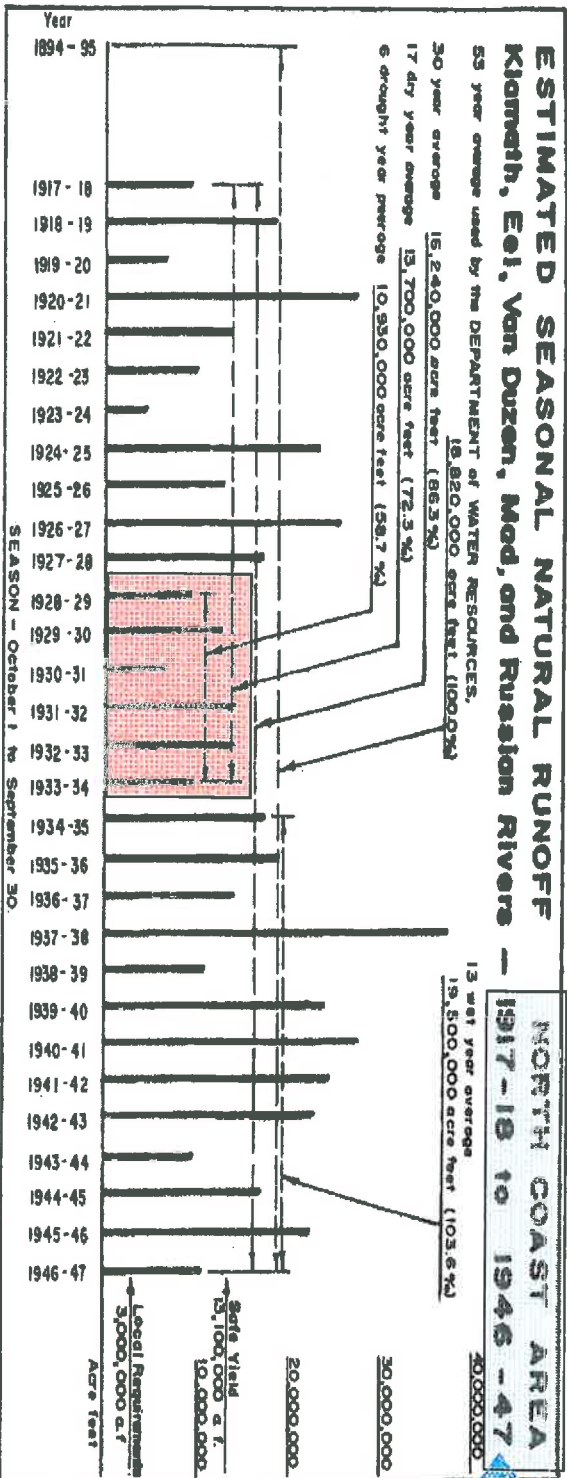
The magnitude of the past and anticipated future uses of water in areas tributary to the Delta, except the Tulare Lake Basin, is indicated in the diagram to the left. It may be noted that, while the present upstream use accounts for reduction of natural inflow to the Delta by almost 25 percent, upstream development during the next 60 years will deplete the inflow by an additional 20 percent. By that date about 22 percent of the natural water supply reaching the Delta will be exported to areas of deficiency by local, state, and federal projects. In addition, economical development of water supplies will necessitate importation of about 5,000,000 acre-feet of water seasonally to the Delta from north coastal streams for transfer to areas of deficiency.



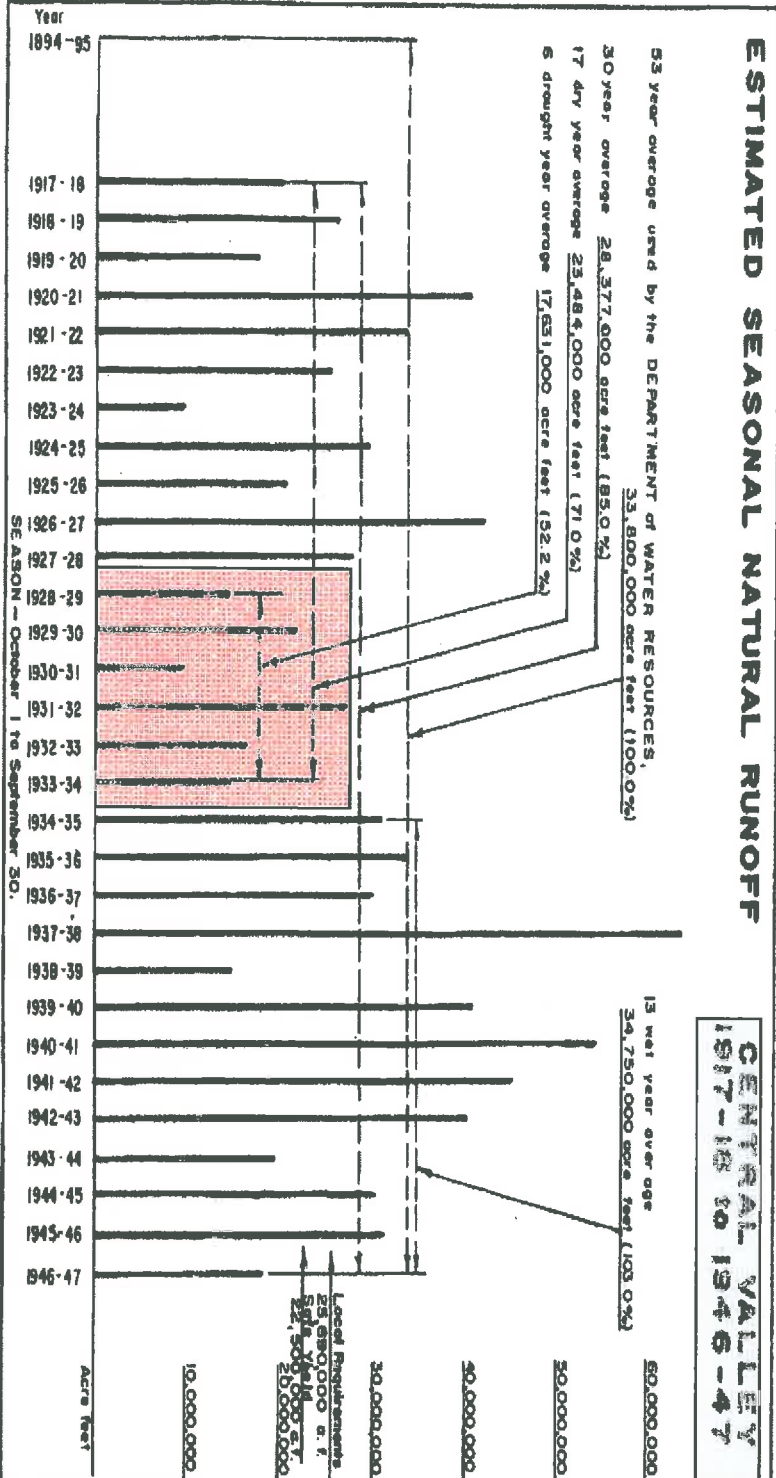
MILLIONS OF ACRE-FEET ANNUALLY



WEBER FOUNDATION STUDIES



Surplus
7,930,000 AF/YF



SHORTAGE
8,049,000 AF/Y

SECTION V BASIC PREMISES

IMPORTANCE OF BASIC PREMISES

Basic premises and basic data are a prerequisite to any sound planning program. In order that the planning be practical and usable, the premises must be realistic and acceptable and the data must be factual. For these reasons a detailed discussion of premises and basic data is included in this report.

Planning cannot arise above the levels established by the premises. If they are limited, so is the planning. If they are false or erroneous, so is the planning. If they are vague, or in conflict with each other, or contrary to important facts, then the planning based upon these assumptions is indefinite, confused and without certain goal. It is not easy to choose and formulate basic premises for studies such as these.

The basic premises are not self-evident. They must be searched for. They have evolved as the result of much research and exploration. They have withstood the erosion of countless tests. As stated here they are believed to be genuinely basic and completely sound.

PREMISE ONE

ALL OF THE WATER RESOURCES AVAILABLE TO THE PEOPLE OF CALIFORNIA SHOULD EVENTUALLY BE DEVELOPED BY AND EQUITABLY DISTRIBUTED FOR THE USE OF THE PEOPLE OF CALIFORNIA

This premise is of prime importance. It colors, limits and conditions all valid thinking regarding water resource development. Its acceptance invalidates at once much of the "project planning" which has heretofore been accepted as proper. It also establishes a standard by which all water development projects and all segments of projects must be tested.

When this premise is accepted, any project must be rejected which develops a water resource for the benefit of a segment of the population to the detriment or neglect of another portion of the population. Also projects must be rejected which are wasteful of water in that a more beneficial (economic) use of the water could be made at some other place. Also rejected are projects which apply a water resource to a present use which will prevent its utilization at some future date for a much more important use.

The acceptance of this premise requires that every use to which any project is put be evaluated in terms of maximum benefit to the whole population, and since the distribution of water limits the distribution of population, water project planning and population planning (land use) must be co-ordinated. The planning agency must be concerned with the ultimate economic return to be derived from each acre-foot of water.

We will run out of available water resources in California before we run out of land suitable for irrigation. There is ultimately no overall state surplus of water. A continually expanding population will, in time, bring us face to face with a very real shortage of fresh water.

Where Is California's Water Supply?

The basic premise that all of the water resources of California must be developed requires that the search for available water supplies be realistic and factual. All the existing information and data regarding water supplies must be critically studied and reviewed. New data must be collected. It is only within the past few years that anyone has attempted to formulate a "water balance sheet" for the State of California. The first such "water balance sheet" to be published appears as Table 3-5 in the State Water Plan (1956 edition).

The figures in this Table 3-5 propose that there is an exportable surplus of 21.22 million acre-feet of water in the north coastal area of California, and in the Sacramento River basin, which can be transported to various water deficient areas in the State.

Critical analysis of the data in Table 3-5 indicates that the figures given for "mean runoff" and "safe yield" are too large to be used as a basis for planning the complete development of California's water resources. The "mean runoff" figures as used in this table are derived by finding the average runoff for a period of 53 years (1894-1947).

Tables and bar graphs of the estimated natural runoff of principal streams of the north coastal area and of the Central Valley follow.

TABLE III
ESTIMATED SEASONAL NATURAL RUNOFF
1917-18 TO 1946-47

FROM NORTH COAST AREA

(Klamath R. near Requa, less Klamath R. at Keno, Eel R. at Scotia, Van Duzen R. at Bridgeville, Mad R. at Sweasy Dam, Russian R. at Guerneville)

(In thousands of acre-feet)

Season Oct. 1-Sept. 30	
1917-18	9,551
-19	18,521
1919-20	6,732
-21	27,181
-22	13,672
-23	9,980
-24	4,272
1924-25	23,033
-26	12,624
-27	25,496
-28	17,097
-29	9,133
1929-30	12,440
-31	6,651
-32	13,843
-33	14,150
-34	9,365
6 year mean (1929-34)	10,930
17 year mean (1917-34)	13,700
1934-35	17,021
-36	18,737
-37	13,593
-38	37,326
-39	10,607
1939-40	23,623
-41	27,302
-42	24,181
-43	22,451
-44	9,335
1944-45	16,834
-46	22,109
-47	10,368
13 year mean (1935-47)	19,504
30 year mean (1917-47)	16,240
53 year mean (1894-47)	
As used by Department of Water Resources	18,820

The Central Valley Area has been subdivided into three parts:

1. Sacramento Valley above Sacramento.
2. The northerly part of the San Joaquin Valley, including the Tuolumne River Basin and all of the area to the north of it, to the Sacramento Valley.
3. The remaining portion of the San Joaquin Valley, to the south of the Tuolumne River Basin.

In each of these subdivisions the estimated runoff is divided into two parts. Part "one" includes the runoff of the streams estimated in Table 62 of "Bulletin No. 1, Water Resources of California, 1951."

Part "two" includes the remainder of the runoff in each subdivision of the Central Valley. The mean seasonal runoff therefor is derived from the quantities given in Table 61 of Bulletin No. 1, for the period extending from 1894-95 to 1946-47. As an approximation of the runoff for each season, the seasonal distribution is assumed to roughly correspond to that of

a stream basin selected from Table No. 62, Bulletin No. 1, in each subdivision of the Central Valley. By reason of the small runoff per square mile, from these areas, as compared to that from the selected stream basin, the resulting quantities will tend to be too small for wet years and too large for dry years. However, it is believed that the error will not be relatively significant for overall quantities. In the Sacramento Valley, the runoff of Stony Creek, above canyon mouth, was selected; in the northerly part of the San Joaquin Valley, the runoff of Calaveras River, at Jenny Lind, was used; and in the southerly part of the San Joaquin Valley the runoff of Tule River above Porterville was used as a criterion for seasonal distribution.

In the Sacramento Valley, part "one" includes the runoff of: Sacramento River near Red Bluff; Feather River at Oroville; Yuba River at Smartsville; Bear River at Wheatland; American River at Fair Oaks; Stony Creek above canyon mouth; Cache Creek near Capay; and Putah Creek near Winters.

In the northerly part of the San Joaquin Valley, part "one" includes the runoff of: Tuolumne River near La Grange; Stanislaus River near Knights Ferry; Calaveras River at Jenny Lind; Mokelumne River near Clements; and Cosumnes River at Michigan Bar.

In the southerly part of the San Joaquin Valley, part "one" includes the runoff of: Kern River near Bakersfield; Tule River above Porterville; Kaweah River near Three Rivers; Kings River at Piedra; San Joaquin River above Friant; Fresno River near Daulton; Chowchilla River at Buchanan Damsite; and Merced River at Exchequer.

The foregoing graphs indicate that the 1894-1947 period contains a 17-year dry period (1917-1934) when the average natural runoff was only 72.3 percent in the north coastal area, and 71.0 percent in the Central Valley of the Department of Water Resources 53-year average for these areas. Also these graphs show that during this 17-year dry period there occurred six years of extreme drought (1928-1934), as many Californians can recall. During this six-year drought period the natural runoff in the Central Valley was only 52.2 percent of the average for the 1894-1947 period. In the north coastal area the average dropped to 58.7 percent of the 53-year average. In the single dry season of 1923-24, the runoff fell to 26.6 percent of the 53-year average for the Central Valley, and 22.7 percent in the north coast.

For the purpose of these studies it is more realistic to base the water development planning on the water supply which would be available to California in a 17-year dry period containing a series of drought years such as occurred in the period from 1917 to 1934. Such dry periods are inevitable. Neither the time of

Season
Oct. 1
Sept.
1917
1919

1924

1929

6-yr.
(1924)

17 yr.
(1917)

1934

1938

194

13 yr.
(193)

30 yr.
(191)

53 yr.
(189)

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TABLE IV
ESTIMATED SEASONAL NATURAL RUNOFF, 1917-18 TO 1946-47
FROM CENTRAL VALLEY AREA

Season	Sacramento Valley		N. San Joaquin Valley		S. San Joaquin Valley		Total
	Part "one"	Part "two"	Part "one"	Part "two"	Part "one"	Part "two"	
Oct. 1- Sept. 30							
1917-18	11,426	1,080	3,253	307	4,609	171	20,846
-19	16,832	2,130	3,070	141	4,176	254	26,603
1919-20	9,444	620	2,811	120	4,584	374	17,953
-21	26,161	4,018	4,789	322	5,292	304	40,866
-22	18,380	1,479	5,476	319	7,687	469	33,828
-23	14,361	990	4,245	262	5,351	345	25,554
-24	5,837	405	1,877	34	1,444	83	9,680
1924-25	17,674	2,348	4,550	230	4,681	306	29,789
-26	13,012	1,412	2,317	95	3,517	166	20,519
-27	26,381	3,610	4,943	262	6,707	440	42,343
-28	18,419	1,945	3,560	189	3,589	174	27,866
-29	8,863	688	1,994	59	2,875	186	14,665
1929-30	14,616	1,306	2,579	96	2,935	156	21,688
-31	6,292	456	1,193	20	1,559	67	9,587
-32	14,016	856	4,684	201	6,884	442	27,083
-33	9,335	640	2,277	47	3,685	269	16,253
-34	9,272	785	1,744	83	2,148	74	14,106
6-yr. mean (1929-1934)	10,399	788	2,412	84	3,348	199	17,230
17 yr. mean (1917-34)	14,137	1,458	3,256	164	4,219	251	23,484
1934-35	18,016	2,049	4,617	217	5,853	302	31,054
-36	18,978	1,905	5,320	415	6,573	540	33,731
-37	14,453	1,386	4,551	336	8,256	949	29,931
-38	35,517	6,208	7,979	540	12,219	1,110	63,573
-39	8,511	508	2,001	47	3,297	274	14,638
1939-40	24,912	3,143	5,301	302	6,486	650	40,794
-41	31,517	7,030	5,378	294	9,256	758	54,233
-42	28,255	3,349	5,625	290	7,205	449	45,173
-43	22,862	2,079	6,011	400	7,837	1,105	40,000
-44	11,090	577	2,737	114	4,276	345	19,139
1944-45	16,023	1,274	4,730	222	7,129	640	30,028
-46	18,908	1,737	4,363	170	5,735	314	31,277
-47	11,014	710	2,349	71	3,647	185	17,976
13 yr. mean (1934-47)	20,004	2,459	4,689	263	6,752	586	34,750
30 yr. mean (1917-47)	16,679	1,891	3,877	207	5,317	396	28,377
53 yr. mean (As used by Department of Water Resources) (1894-1947)	19,958	2,591	4,463	288	6,044	456	33,800

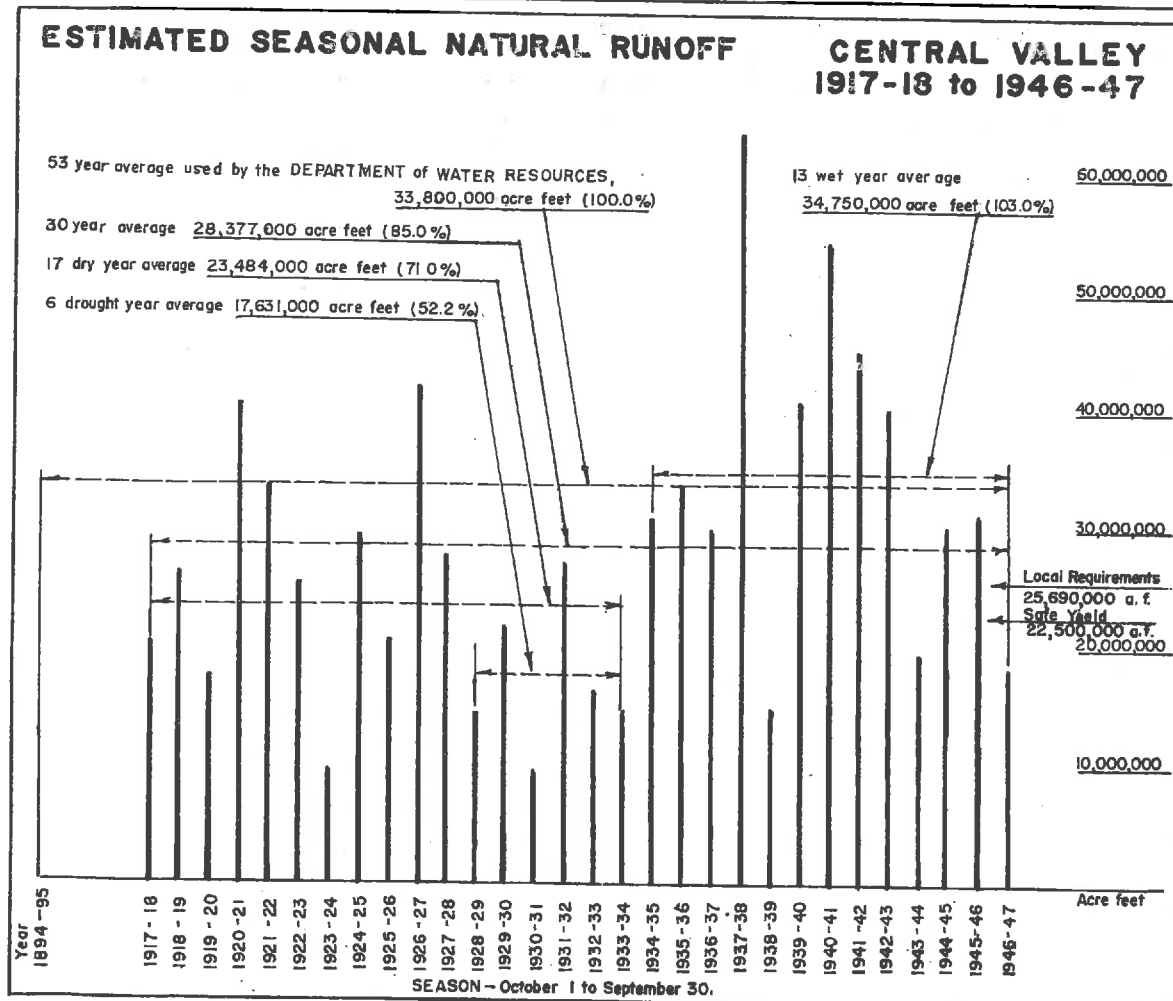
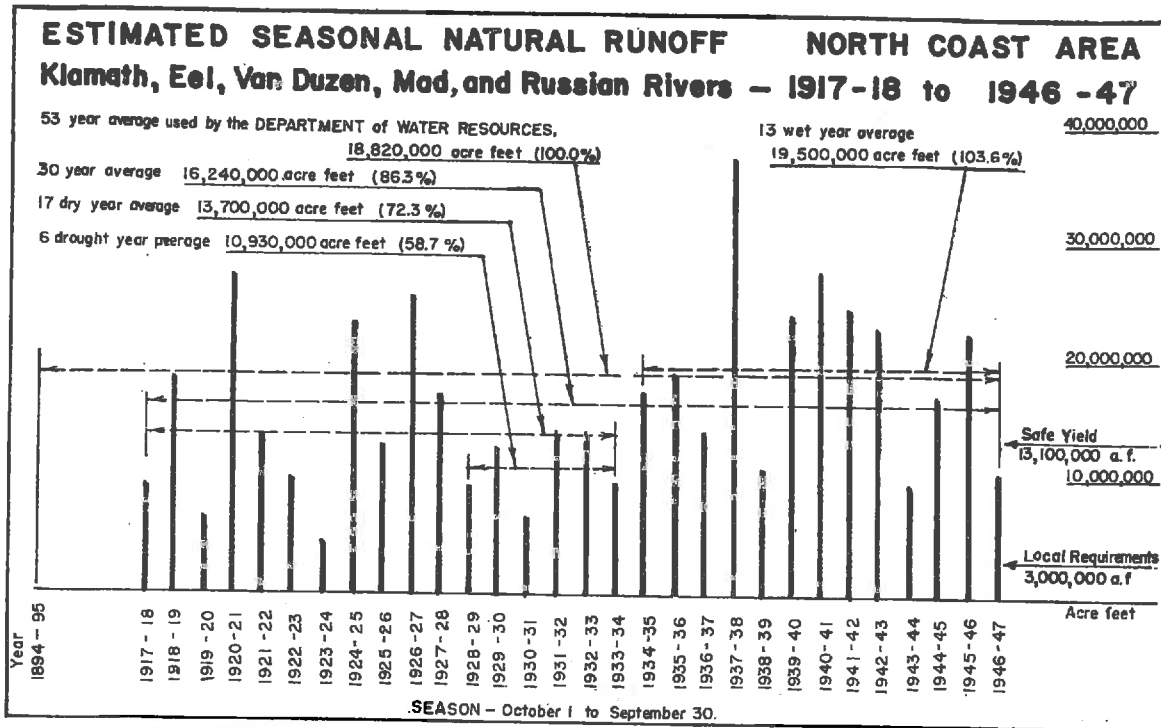
their coming nor their duration is predictable. They are, however, facts which we must face and with which we must live.

The Water Supply "Balance Sheet"

The following Table V repeats the form and figures in State Water Plan Table 3-5. For comparison purposes new figures are shown in parenthesis () based upon the water supply available during a 17-year dry period. (It is assumed that this dry period is preceded by at least three wet years and that all reservoirs

developed for year to year carry-over storage are filled at the beginning of the dry period.) Also, a restudy has been made of water requirements for all areas of the State.

These adjusted figures reveal an overall average annual deficiency of water in California of 6.22 million acre-feet during a 17-year dry period. The sheet can be made to balance by reducing the seasonal water requirements of all areas by 12.7 percent, or to nearly balance by eliminating exports to the Lahontan area. (See notes following table.)

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TABLE V
SUMMARY OF ESTIMATED ULTIMATE MEAN SEASONAL EXPORTS AND IMPORTS OF WATER

(Million Acre-Feet)

Figures in parenthesis—Adjusted to 17-year mean and restudy of seasonal requirements.
Other figures—State Water Plan Table 3-5—Bulletin No. 3—May 1956.

Hydrographic area	Mean runoff	Safe yield	Present rights for		Seasonal water requirements	Seasonal surplus for export	Seasonal deficiency to be met by import	Notes
			Import	Export				
COASTAL								
North Coastal.....	28.89 (20.40)	13.69 (13.10)			2.10 (3.00)	11.59 (10.10)		#1
San Francisco Bay.....	1.25 (.90)	.53 (.40)	.67 (.67)		3.51 (3.30)		2.31 (2.23)	#2
Central Coastal—Monterey County South to Ventura County.....	2.45 (1.80)	1.17 (1.00)			2.36 (2.46)		1.19 (1.46)	#3
South Coastal—Los Angeles County to San Diego County.....	1.23 (.90)	1.15 (.80)	1.53 (1.53)		5.55 (5.55)		2.87 (3.22)	#4
CENTRAL VALLEY								
Sacramento River Basin.....	22.39 (15.60)	18.44 (15.00)			7.72 (9.00)	9.63 (6.00)		#5
San Joaquin and Tulare River Basins.....	11.25 (7.90)	9.08 (7.50)		.67 (.67)	16.31 (16.69)		7.90 (9.86)	#6
LAHONTAN								
Area North of Mono Basin.....	1.84 (1.80)	.31 (.31)			1.33 (.31)		1.02 (.00)	
Mono Basin and Area South.....	1.33 (1.00)	.83 (.70)		.32 (.32)	5.40 (4.02)		4.84 (3.64)	#7
Colorado Desert.....	.22 (.13)	.08 (.07)	4.15 (4.15)		5.62 (4.23)		1.39 (.00)	
California's Right to Colorado River Water.....		5.36 (5.36)		5.36 (5.36)				
Requirements for works in Delta and Losses in Transport and Storage.....					.72* (1.90)			#8
Totals.....	70.85 (49.93)	50.64 (44.24)	6.35 (6.35)	6.35 (6.35)	50.62 (50.46)	21.22 (16.10)	21.52 (20.41)	#9
Average Annual Deficiency.....					(-6.22)			

* Operation of Delta Works only.

Notes on Water Supply "Balance Sheet"

NOTE 1—The adjusted estimates are based on the 17-dry-year (1917-1934) runoff of north coastal watersheds and are 72.3 percent of the figure used by State Water Plan authorities. The adjusted yield, however, is only slightly less. The State Water Plan figure of 2.1 million acre-feet for north coastal use is considered to be too low in the light of probable future industrial developments in the north coastal area. A total use of 3.0 million acre-feet of water appears to be a more realistic figure. This leaves a 10.1 million acre-feet seasonal surplus for export, which is only 87 percent of the amount estimated in the State Water Plan. Even this amount is probably larger than can be practically transported into the Central Valley.

NOTE 2—In the San Francisco Bay area the adjusted estimate based on the 17-dry-year period reduces the safe annual yield from local sources to 0.4 million acre-feet. Restudy of the ultimate seasonal requirements results in a figure of 3.3 million acre-feet. The San Francisco Bay area now imports 0.67 million acre-feet of water from the San Joaquin Basin. (See Note No. 6.)

NOTE 3—The adjusted estimate based on the 17-dry-year period indicates that the safe annual yield in the central coastal

area is 1.0 million acre-feet of water. Restudy of the ultimate seasonal water requirement indicates that this area can utilize 2.46 million acre-feet.

NOTE 4—The south coastal area, which has an estimated ultimate annual water requirement of 5.5 million acre-feet, would have, during a 17-dry-year period, a safe annual yield of only 0.8 million acre-feet. This area now has import rights amounting to 1.53 million acre-feet. (0.32 m.a.f. from Mono and Owens basins and 1.21 m.a.f. from the Colorado River.) It must, therefore, import 3.22 million acre-feet from some northern source to meet its ultimate requirements.

NOTE 5—Based upon the 53-year period (1894-1947) the mean annual runoff in the Sacramento River Basin area is 22.39 million acre-feet. During the 17-dry-year period (1918-1937) the average annual runoff is reduced to 15.6 million acre-feet. The safe annual yield is estimated at 15.0 million acre-feet. The seasonal water requirements as estimated in the State Water Plan are too low for a dry period. New acreage coming into production is allotted less than two acre-feet per annum. Restudy of the ultimate water requirements of the Sacramento River Basin area indicates that 9.0 million acre-feet of water per year would be needed to meet annual requirements during such a 17-year dry period.

Notes on Water Supply "Balance Sheet"—Continued

The seasonal surplus available for export is 6.0 million acre-feet of water, which is less than that required to meet deficiencies in the San Joaquin and Tulare Basins.

NOTE 6—Average runoff in the San Joaquin and Tulare Basin areas based on the 17-dry-year period (1917-1934) is estimated at 7.88 million acre-feet, 10.1 percent of the 53-year (1894-1947) state total average annual runoff. The safe annual yield is estimated at 7.5 million acre-feet, and the seasonal water requirement is 16.69 million acre-feet. This area, which is thus deficient by 9.19 million acre-feet, exports 0.67 m.a.f. to the San Francisco Bay area, increasing its total deficiency to 9.86 million acre-feet of water.

Considering the great Central Valley as one unit, the average annual safe yield for the 17-dry-year period (1917-1934) is 22.5 million acre-feet, and the combined ultimate water requirements are 25.69 million acre-feet. Consequently, during a 17-dry-year period such as 1917-1934, this area would suffer an average annual water deficiency of 3.19 million acre-feet, or else would require additional usable surface and underground storage capacity of $3.19 \times 17 = 54.2$ million acre-feet plus about 10 percent for carryover and transportation losses. This additional stored capacity would have to be full at the beginning of the 17-year dry period.

NOTE 7—The problem of water for the desert areas of California is a very special one. The estimates of seasonal requirements in the desert areas are based on the available arable land and not upon studies of economic yield per acre-foot of water. The State Water Plan (Bulletin No. 3) estimates that the seasonal water requirements for the irrigation of irrigable areas are 12.35 million acre-feet. A restudy which discards lands which obviously can be served with water only at the expense of more productive lands reduces this seasonal requirement to 9.58 million acre-feet. More critical studies should reduce the figure even further. Water resources in the desert areas are estimated at 5.23 million acre-feet. This includes an estimated safe yield of 1.08 million acre-feet, and a water right of 4.15 million acre-feet from the Colorado River. These areas are now probably richer in water resources than any comparable desert areas on the face of the earth.

The average annual water deficiency of the desert areas as revised for the 17-dry-year period (1917-1934) is estimated at 4.16 million acre-feet. This is 66.8 percent of the average annual deficiency for the entire State. (See Note No. 9.)

NOTE 8—The State Water Plan (Bulletin No. 3) estimates that 0.72 million acre-feet of water is required for the operation of works in the Sacramento-San Joaquin Delta. No allowance is made for losses in the storage and transportation of water. (An earlier version of Table 3-5 made an allowance of 1.74 million acre-feet for the above combined uses.)

The Weber Foundation studies indicate that 1.90 million acre-feet per annum must be allotted for the operation of Delta works and for losses in the transportation of water.

NOTE 9—The State Water Plan "balance sheet" balances; that is, safe seasonal yield equals seasonal water requirements, and seasonal surplus for export equals seasonal deficiencies to be met by import. The water supply figures adjusted to the 17-dry-year period (1917-1934) and the restudied seasonal requirements do not balance but indicate that during a 17-dry-year period California would suffer an average annual deficiency of 6.22 million acre-feet. The figures can be made to balance by reducing the seasonal water requirements of the various areas by 12.7 percent or by having a supplemental volume of more than 105 million acre-feet of stored water supply at the beginning of such a critical period.

If the technical, financial, legal and political problems can be solved, a large part of such storage volume could be provided by ground water basin storage. Some potential surface reservoir sites, such as a Greater Monticello Reservoir and a Great Kern Canyon Reservoir, could provide about 20 percent of that volume, and thereby make it possible to greatly extend the ground water replenishment periods, and thereby increase the total input during wet periods.

PREMISE TWO

THE ECONOMIC FEASIBILITY OF SPECIFIC PROJECTS ESSENTIAL TO THE ULTIMATE DEVELOPMENT OF OUR WATER RESOURCES MUST BE CONSIDERED IN THE LIGHT OF THE TOTAL DEVELOPMENT OF WATER RESOURCES

Preliminary studies of proposed water development projects are required to determine (1) The "engineering feasibility" (practicability) of the project, and (2) The "economic feasibility" (ratio between cost and return) of the project. Inasmuch as the art of the economist is less "scientific" in its approach to the solution of its feasibility problems than is the art of the engineer, much of the controversy regarding project feasibility arises in the economic field.

Many proposed water development projects, which upon investigation prove to be feasible from an engineering standpoint, are judged to be (at a specific time and place) "economically unfeasible" because no definite future value can be assigned to the necessity (demand) for water.

As population gains, and water development in California proceeds, and undeveloped water resources become scarce or more remote, then the limits of economic feasibility approach the limits of engineering feasibility.

Water is a necessity. Ultimately the demand for water will exceed the natural usable supply and the "value" which can be placed upon water will be sufficient to justify as economically feasible any project which is judged to be feasible or practical from an engineering standpoint.

Thus, in these studies, any water development project essential to the ultimate total water development plan, which is feasible from an engineering standpoint, is considered to be ultimately economically feasible. Studies of economic feasibility, separate from engineering feasibility, are important only in determining priorities for the specific projects in the total water development program.

Economic feasibility studies in the development of California water resources rest heavily upon the "values" which are and which in the future will be placed upon water development "byproducts" such as power, fish production, recreation, and navigation, and upon such special water expenditures as flood wastes and salt and organic pollution control.

Economic necessity will in the future engender many technological advances which will extend the limits of engineering feasibility. We will (it is sincerely hoped) solve some of the perplexing problems inherent in the subsurface storage of water supplies. Certainly we will learn how to construct larger and longer tunnels at lesser costs than prevail today. We may find ways to reduce loss of water by evaporation from storage reservoir surfaces. Our new understand-

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Unimpaired Flow Sacramento and San Joaquin Valley from Department of Water Resources California Data Exchange Center

Water Year	Water Year Sum	Water Year Average
1929	11.24	13.12
1930	16.77	
1931	7.76	
1932	19.75	
1933	12.28	8.17
1934	10.91	
1976	10.17	
1977	6.17	
1987	11.35	12.71
1988	11.71	
1989	18.38	
1990	11.72	
1991	11.64	13.25
1992	11.45	
2007	12.79	
2008	13.71	

On October 12, 1948, Secretary of the Interior Krug, in a public speech at Oroville, stated: "Let me state, clearly and finally, the Interior Department is fully and completely committed to the policy that no water which is needed in the Sacramento Valley will be sent out of it." He added: "There is no intent on the part of the Bureau of Reclamation ever to divert from the Sacramento Valley a single acre-foot of water which might be used in the valley now or later." (Staff 9, p. 799 & SRDWA 19).

On November 15, 1949, Regional Director Richard L. Boke reaffirmed these main policy statements and summarized them in a letter to Congressman Clair Engle, stating, "We believe the foregoing is a summary of the main policy statements by Government officials on the subject of importation of Sacramento Valley water to the San Joaquin Valley." (Staff 9, p. 799 & SRDWA 19).

PROMISE
NOT KEPT

ID 990 at pages 70 and 71

EXHIBIT H

§ 11460. Prior right to watershed water

In the construction and operation by the department of any project under the provisions of this part a watershed or area wherein water originates, or an area immediately adjacent thereto which can conveniently be supplied with water therefrom, shall not be deprived by the department directly or indirectly of the prior right to all of the water reasonably required to adequately supply the beneficial needs of the watershed, area, or any of the inhabitants or property owners therein.

(Added by Stats.1943, c. 370, p. 1896. Amended by Stats.1957, c. 1932, p. 3410, § 296.)

§ 11453

are fully redeemed and paid. (*Added by Stats.1943, c. 370, p. 1896.*)

§ 11454. Rates and charges; contracts; indemnification provisions

Under such regulations and upon such terms, limitations, and conditions as it prescribes, the department may do any of the following:

(a) Fix and establish the prices, rates, and charges at which the resources and facilities made available by the project shall be sold and disposed of.

(b)(1) Enter into contracts and agreements and do any and all things which in its judgment are necessary, convenient, or expedient for the accomplishment of the purposes and objects of this part.

(2) The contracts and agreements may include provisions for the indemnification of parties with whom the department contracts as necessary to accomplish the purposes and objects of this part, except that the contracts and agreements may not include provisions for the indemnification, including indemnification for any costs of defense, of any party to those contracts or agreements for that party's acts or omissions involving negligence, gross negligence, recklessness, or willful misconduct or for acts or omissions involving negligence, gross negligence, recklessness, or willful misconduct on the part of that party's employees, agents, or contractors.

(3) The Legislature finds and declares that the amendments made to this subdivision during the 1997 portion of the 1997-98 Regular Session are declaratory of existing law. (*Added by Stats.1943, c. 370, p. 1896. Amended by Stats.1957, c. 1932, p. 3410, § 293; Stats.1997, c. 566 (§.B.543), § 1, eff. Sept. 29, 1997.*)

§ 11455. Revenue requirements

The department shall enter into such contracts and fix and establish such prices, rates, and charges so as at all times to provide revenue which will afford sufficient funds to pay all costs of operation and maintenance of the works authorized by this part, together with necessary repairs and replacements thereto, and which will provide at all times sufficient funds for redemption of all bonds and payment of interest thereon, as and when such costs and charges become due and payable. (*Added by Stats.1943, c. 370, p. 1896. Amended by Stats.1957, c. 1932, p. 3410, § 294.*)

ARTICLE 3. LIMITATION OF POWERS

Section

11460. Prior right to watershed water.

11461. Purchase of watershed water rights.

11462. Creation of new property rights.

11463. Exchange of watershed water.

11464. Conveyance of property.

11465. Revision of charges, established by contract.

262

WATER CODE

§ 11460. Prior right to watershed water

In the construction and operation by the department of any project under the provisions of this part a watershed or area wherein water originates, or an area immediately adjacent thereto which can conveniently be supplied with water therefrom, shall not be deprived by the department directly or indirectly of the prior right to all of the water reasonably required to adequately supply the beneficial needs of the watershed, area, or any of the inhabitants or property owners therein. (*Added by Stats.1943, c. 370, p. 1896. Amended by Stats.1957, c. 1932, p. 3410, § 296.*)

§ 11461. Purchase of watershed water rights

In no other way than by purchase or otherwise as provided in this part shall water rights of a watershed, area, or the inhabitants be impaired or curtailed by the department, but the provisions of this article shall be strictly limited to the acts and proceedings of the department, as such, and shall not apply to any persons or state agencies. (*Added by Stats.1943, c. 370, p. 1896. Amended by Stats.1957, c. 1932, p. 3410, § 297.*)

§ 11462. Creation of new property rights

The provisions of this article shall not be so construed as to create any new property rights other than against the department as provided in this part or to require the department to furnish to any person without adequate compensation therefor any water made available by the construction of any works by the department. (*Added by Stats.1943, c. 370, p. 1896. Amended by Stats.1957, c. 1932, p. 3410, § 298.*)

§ 11463. Exchange of watershed water

In the construction and operation by the department of any project under the provisions of this part, no exchange of the water of any watershed or area for the water of any other watershed or area may be made by the department unless the water requirements of the watershed or area in which the exchange is made are first and at all times met and satisfied to the extent that the requirements would have been met were the exchange not made, and no right to the use of water shall be gained or lost by reason of any such exchange. (*Added by Stats.1943, c. 370, p. 1896. Amended by Stats.1957, c. 1932, p. 3411, § 299.*)

§ 11464. Conveyance of property

No water right, reservoir, conduit, or facility for the generation, production, transmission, or distribution of electric power, acquired by the department shall ever be sold, granted, or conveyed by the department so that the department thereby is divested of the title to and ownership of it. (*Added by Stats.1943, c. 370, p. 1896. Amended by Stats.1957, c. 1932, p. 3411, § 300.*)

§ 11465. Revision of charges, established by contract

The department shall not make any change, alteration, or revision of any rates, prices, or charges established by any contract entered into pursuant to this part except as

§ 11207. Primary purposes

Shasta Dam shall be constructed and used primarily for the following purposes:

(a) Improvement of navigation on the Sacramento River to Red Bluff.

(b) Increasing flood protection in the Sacramento Valley.

(c) Salinity control in the Sacramento-San Joaquin Delta.

(d) Storage and stabilization of the water supply of the Sacramento River for irrigation and domestic use. (*Added by Stats.1943, c. 370, p. 1896.*)

Title THE CALIFORNIA WATER RESOURCES DEVELOPMENT BOND ACT
Year/Election 1960 general
Proposition type bond (leg)
Popular vote Yes: 3,008,328 (51.5%); No: 2,834,384 (48.5%)
Pass/Fail Pass
Summary

This act provides for a bond issue of one billion, seven hundred fifty million dollars (\$1,750,000,000) to be used by the Department of Water Resources for the development of the water resources of the State.

For **Argument in Favor of California Water Resources Development Bond Act**

Your vote on this measure will decide whether California will continue to prosper.

This Act, if approved, will launch the statewide water development program which will meet present and future demands of all areas of California. The program will not be a burden on the taxpayer; no new state taxes are involved; the bonds are repaid from project revenues, through the sale of water and power. In other words, it will pay for itself. The bonds will be used over a period of many years and will involve an approximate annual expenditure averaging only \$75 million, as compared, for example with \$600 million a year we spend on highways.

Existing facilities for furnishing water for California's needs will soon be exhausted because of our rapid population growth and industrial and agricultural expansion. We now face a further critical loss in the Colorado River supply. Without the projects made possible by this Act, we face a major water crisis. We can stand no more delay.

If we fail to act now to provide new sources of water, land development in the great San Joaquin Valley will slow to a halt by 1965 and the return of cultivated areas to wasteland will begin. In southern California, the existing sources of water which have nourished its tremendous expansion will reach capacity by 1970 and further development must wholly cease. In northern California desperately needed flood control and water supplies for many local areas will be denied.

This Act will assure construction funds for new water development facilities to meet California's requirements now and in the future. No area will be deprived of water to meet the needs of another. Nor will any area be asked to pay for water delivered to another.

To meet questions which concerned, southern California, the bonds will finance completion of all facilities needed, as described in the Act. Contracts for delivery of water may not be altered by the Legislature. The tap will be open, and no amount of political maneuvering can shut it off.

Under this Act the water rights of northern California will remain securely protected. In addition, sufficient money is provided for construction of local projects to meet the pressing needs for flood control, recreation and water deliveries in the north.

A much needed drainage system and water supply will be provided in the San Joaquin Valley.

Construction here authorized will provide thousands of jobs. And the program will nourish tremendous industrial and farm and urban expansion which will develop an ever-growing source of employment and economic prosperity for Californians.

Our Legislature has appropriated millions of dollars for work in preparation, and construction is now underway. It would be tragic if this impressive start toward solution of our water problems were now abandoned.

If we fail to act now to insure completion of this constructive program, serious existing water shortages will only get worse. The success of our State is at stake. Vote "Yes" for water for people, for progress, for prosperity!

EXHIBIT L

STATE WATER RESOURCES

§ 12205

applicable, and with like effect. Where the law applicable to such agency does not set forth a procedure for the judicial determination of the validity of the public agency's bonds, the action shall be had as in the case of the judicial determination of the general obligation bonds of irrigation districts under the Irrigation District Law (Division 11 (commencing with Section 20500) of this code), as it may now or hereafter be amended, as nearly as the same may be applicable, and with like effect. (*Added by Stats. 1966, 1st Ex. Sess., c. 42, p. 351, § 1, eff. May 2, 1966.*)

Part 4.5

SACRAMENTO-SAN JOAQUIN DELTA

Chapter	Section
1. General Policy	12200
2. The Delta	12201
3. Sacramento-San Joaquin Delta Levees	12225

CHAPTER 1. GENERAL POLICY

Section	Legislative findings and declaration.
12200.	Necessity of maintenance of water supply.
12201.	Salinity control and adequate water supply; substitute water supply; delivery.
12202.	Salinity control and adequate water supply; substitute water supply; delivery.
12203.	Diversion of waters from channels of delta.
12204.	Exportation of water from delta.
12205.	Storage of water; integration of operation and management of release of water.

§ 12200. Legislative findings and declaration

The Legislature hereby finds that the water problems of the Sacramento-San Joaquin Delta are unique within the State; the Sacramento and San Joaquin Rivers join at the Sacramento-San Joaquin Delta to discharge their fresh water flows into Suisun, San Pablo and San Francisco Bays and thence into the Pacific Ocean; the merging of fresh water with saline bay waters and drainage waters and the withdrawal of fresh water for beneficial uses creates an acute problem of salinity intrusion into the vast network of channels and sloughs of the Delta; the State Water Resources Development System has as one of its objectives the transfer of waters from water-surplus areas in the Sacramento Valley and the north coastal area to water-deficient areas to the south and west of the Sacramento-San Joaquin Delta via the Delta; water surplus to the needs of the areas in which it originates is gathered in the Delta and thereby provides a common source of fresh water supply for water-deficient areas. It is, therefore, hereby declared that a general law cannot be made applicable to said Delta and that the enactment of this law is necessary for the protection, conservation, development, control and use of the waters in the Delta for the public good. (*Added by Stats. 1959, c. 1766, p. 4247, § 1.*)

§ 12201. Necessity of maintenance of water supply

The Legislature finds that the maintenance of an adequate water supply in the Delta sufficient to maintain and expand agriculture, industry, urban, and recreational development in the Delta area as set forth in Section 12220, Chapter 2, of this part, and to provide a common source of fresh water for export to areas of water deficiency is necessary to the peace, health, safety and welfare of the people of the State, except that delivery of such water shall be subject to the provisions of Section 10505 and Sections 11460 to 11463, inclusive, of this code. (*Added by Stats. 1959, c. 1766, p. 4247, § 1.*)

§ 12202. Salinity control and adequate water supply; substitute water supply; delivery

Among the functions to be provided by the State Water Resources Development System, in coordination with the activities of the United States in providing salinity control for the Delta through operation of the Federal Central Valley Project, shall be the provision of salinity control and an adequate water supply for the users of water in the Sacramento-San Joaquin Delta. If it is determined to be in the public interest to provide a substitute water supply to the users in said Delta in lieu of that which would be provided as a result of salinity control no added financial burden shall be placed upon said Delta water users solely by virtue of such substitution. Delivery of said substitute water supply shall be subject to the provisions of Section 10505 and Sections 11460 to 11463, inclusive, of this code. (*Added by Stats. 1959, c. 1766, p. 4247, § 1.*)

§ 12203. Diversion of waters from channels of delta

It is hereby declared to be the policy of the State that no person, corporation or public or private agency or the State or the United States should divert water from the channels of the Sacramento-San Joaquin Delta to which the users within said Delta are entitled. (*Added by Stats. 1959, c. 1766, p. 4249, § 1.*)

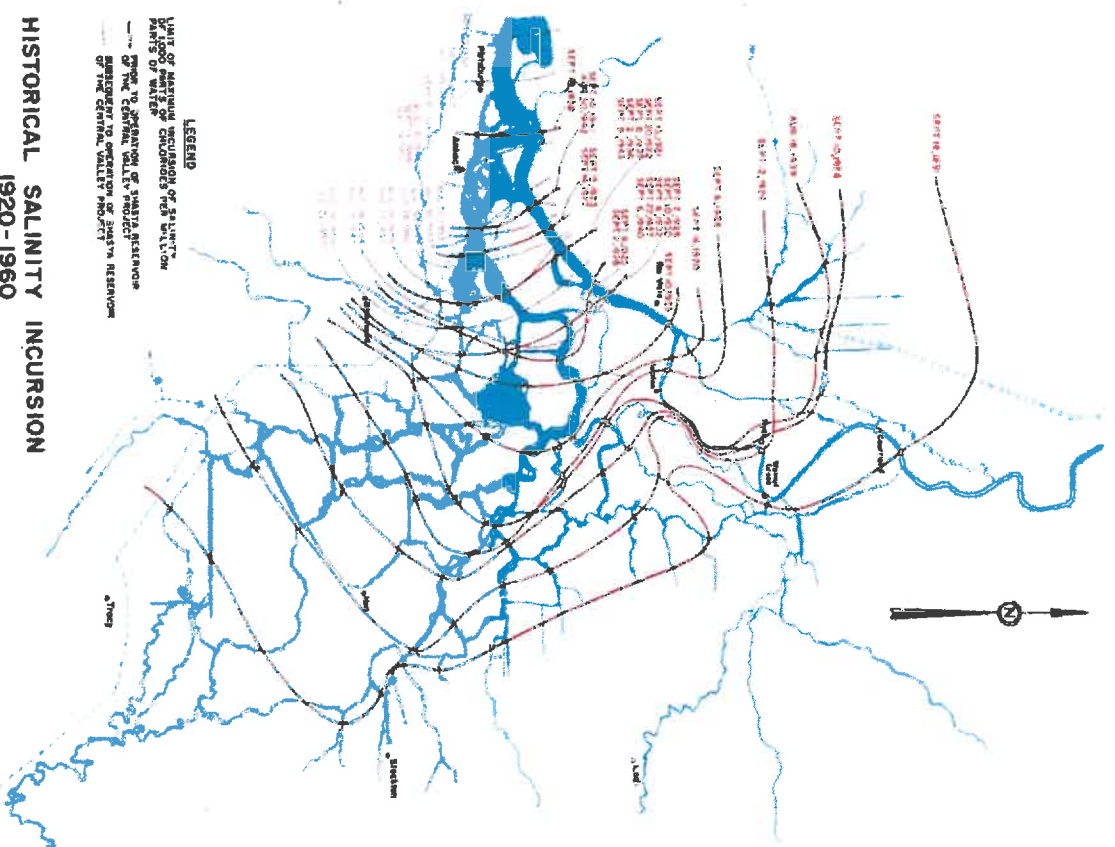
§ 12204. Exportation of water from delta

In determining the availability of water for export from the Sacramento-San Joaquin Delta no water shall be exported which is necessary to meet the requirements of Sections 12202 and 12203 of this chapter. (*Added by Stats. 1959, c. 1766, p. 4249, § 1.*)

§ 12205. Storage of water; integration of operation and management of release of water

It is the policy of the State that the operation and management of releases from storage into the Sacramento-San Joaquin Delta of water for use outside the area in which such water originates shall be integrated to the maximum extent possible in order to permit the fulfillment of the objectives of this part. (*Added by Stats. 1959, c. 1766, p. 4249, § 1.*)

Delta Problems — salinity incursion and water supplies

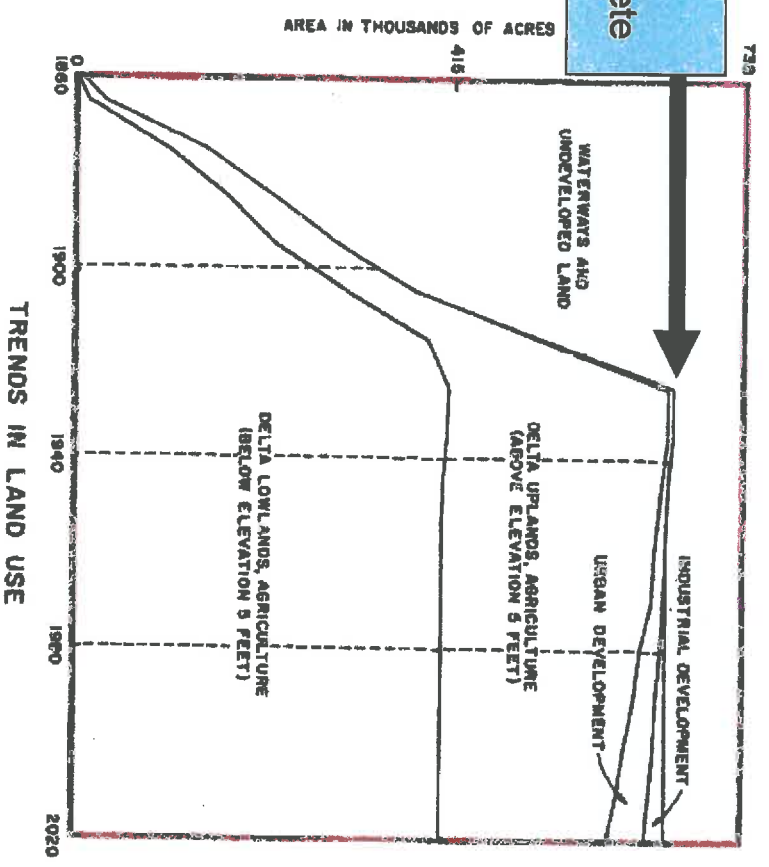
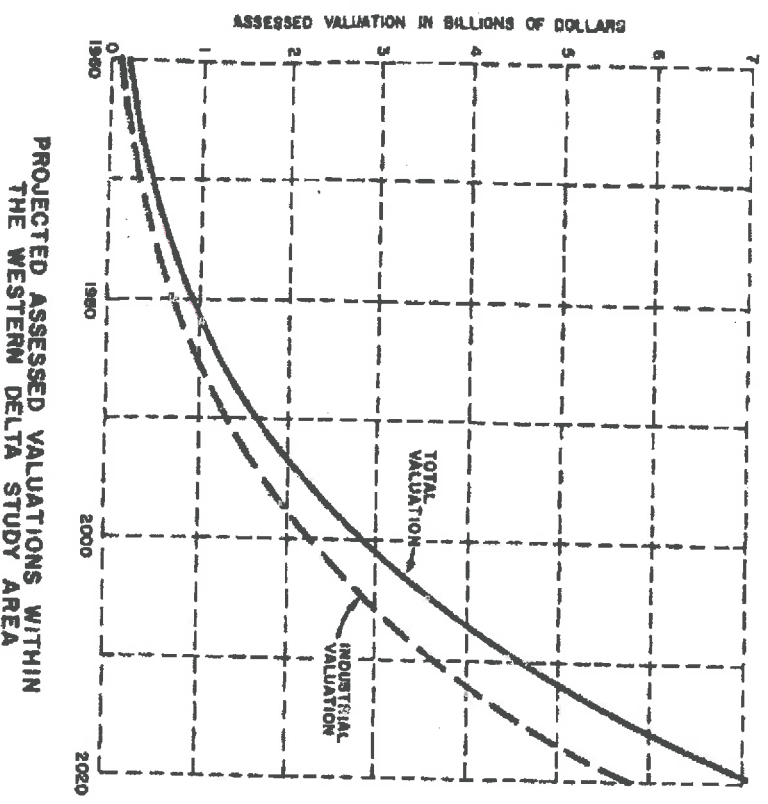


Salinity incursion into the Delta results from the flooding and ebbing of ocean tides through the San Francisco Bay and Delta system during periods when the fresh water outflow from the Delta is insufficient to repel the saline water. The natural fresh water outflow from the Central Valley was historically inadequate to repel salinity during summer months of some years. The first known record of salinity encroachment into the Delta was reported by Cmdr. Ringgold, U. S. Navy, in August 1841, whose party found the water at the site of the present city of Antioch very brackish and unfit for drinking. Since that time, and particularly after the turn of the century, with expanding upstream water use salinity incursion has become an increasingly greater problem in Delta water supplies. The maximum recorded extent of salinity incursion happened in 1931, when ocean salts reached Stockton. Since 1944 extensive incursion has been repeated much of the time by fresh water releases from Central Valley Project storage in Shasta and Folsom Reservoirs. Without such releases, saline water would have spread through about 90 percent of the Delta channels in 1955 and 1959. Although upstream uses might not have reached present levels in the absence of the Central Valley Project, salinity problems would still have been very serious during most years.

Further increase in water use in areas tributary to the Delta will worsen the salinity incursion problem and complicate the already complex water rights situation. To maintain and expand the economy of the Delta, it will be necessary to provide an adequate supply of good quality water and protect the lands from the effects of salinity incursion. In 1959 the State Legislature directed that water shall not be diverted from the Delta for use elsewhere unless adequate supplies for the Delta are first provided.

Several towns and cities are located in the upland areas and an industrial complex is expanding in the Delta. Early industrial development centered around building activity. Large water-using industries, such as paper products, and chemicals, have developed in the area where water, rail, and highway transportation, coupled with water supplies, has stimulated growth. The manufacturing employment in this area was about 10,000 people in 1960.

1925 Delta Reclamation Complete



A deep-draft ship channel serving commercial and military installations terminates at Stockton, and another is being constructed to Sacramento. Water-borne shipments in the Delta amounted to about 6,000,000 tons annually in recent years.

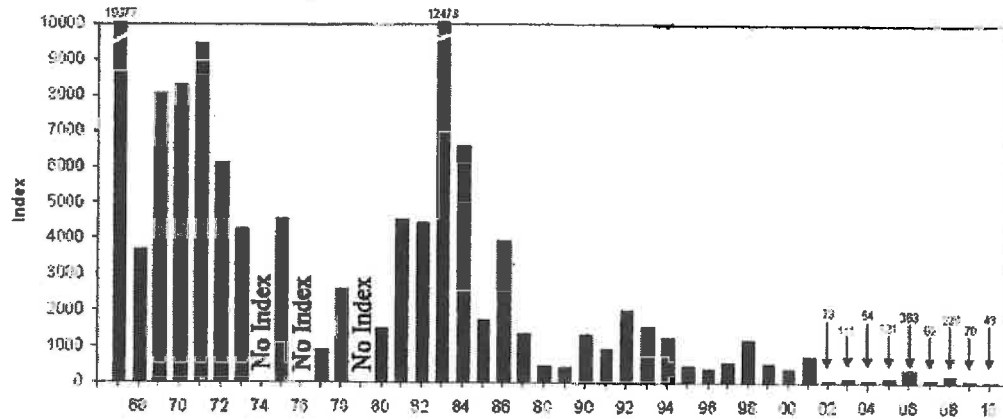
The Delta encompasses one of California's most important high quality natural gas fields. Since 1941 the field has produced about 300,000,000 cubic feet of methane gas for use in the San Francisco Bay area.

With the growing significance of recreation, the Delta has blossomed into a major recreation area at the doorsteps of metropolitan development in the San Francisco Bay area, Sacramento, and Stockton. In 1960, nearly 2,800,000 recreation-days were enjoyed in this boating wonderland.

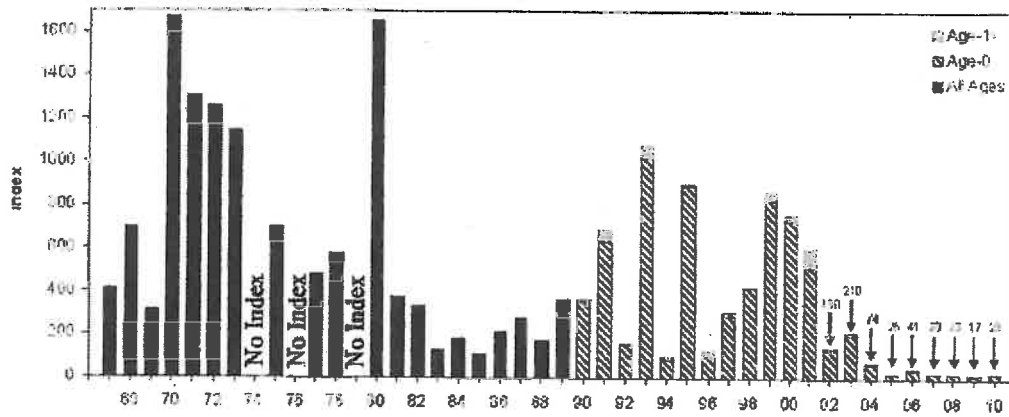
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EXHIBIT P

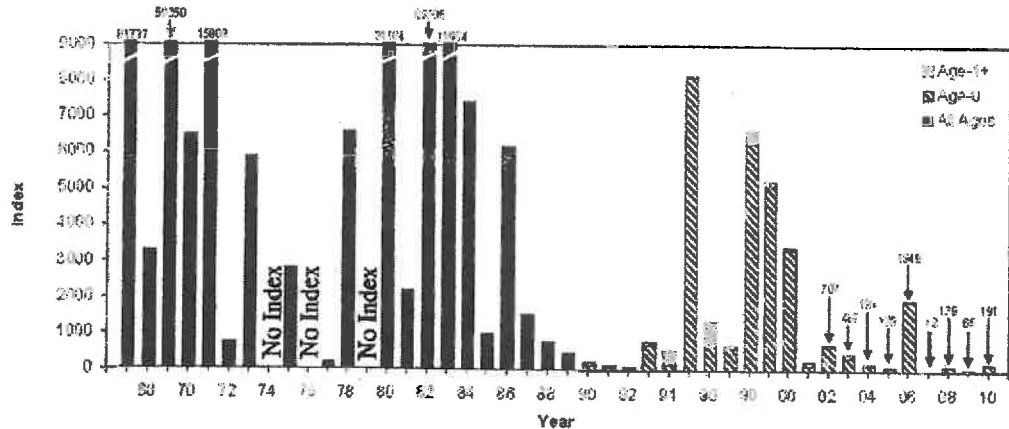
Age-0 Striped Bass Indices From 1967-2010

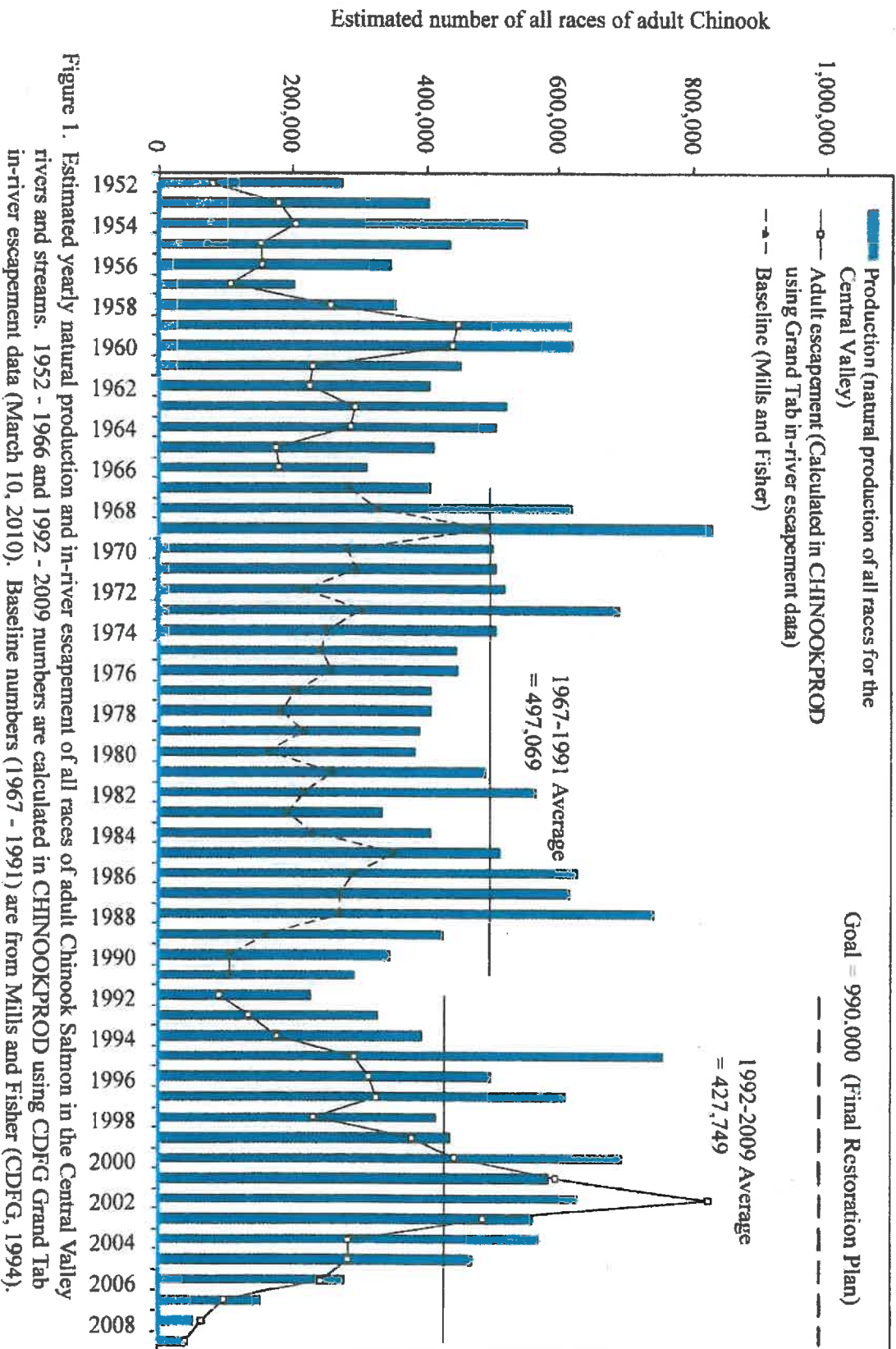


Delta Smelt Indices From 1967-2010



Longfin Smelt Indices From 1967-2010





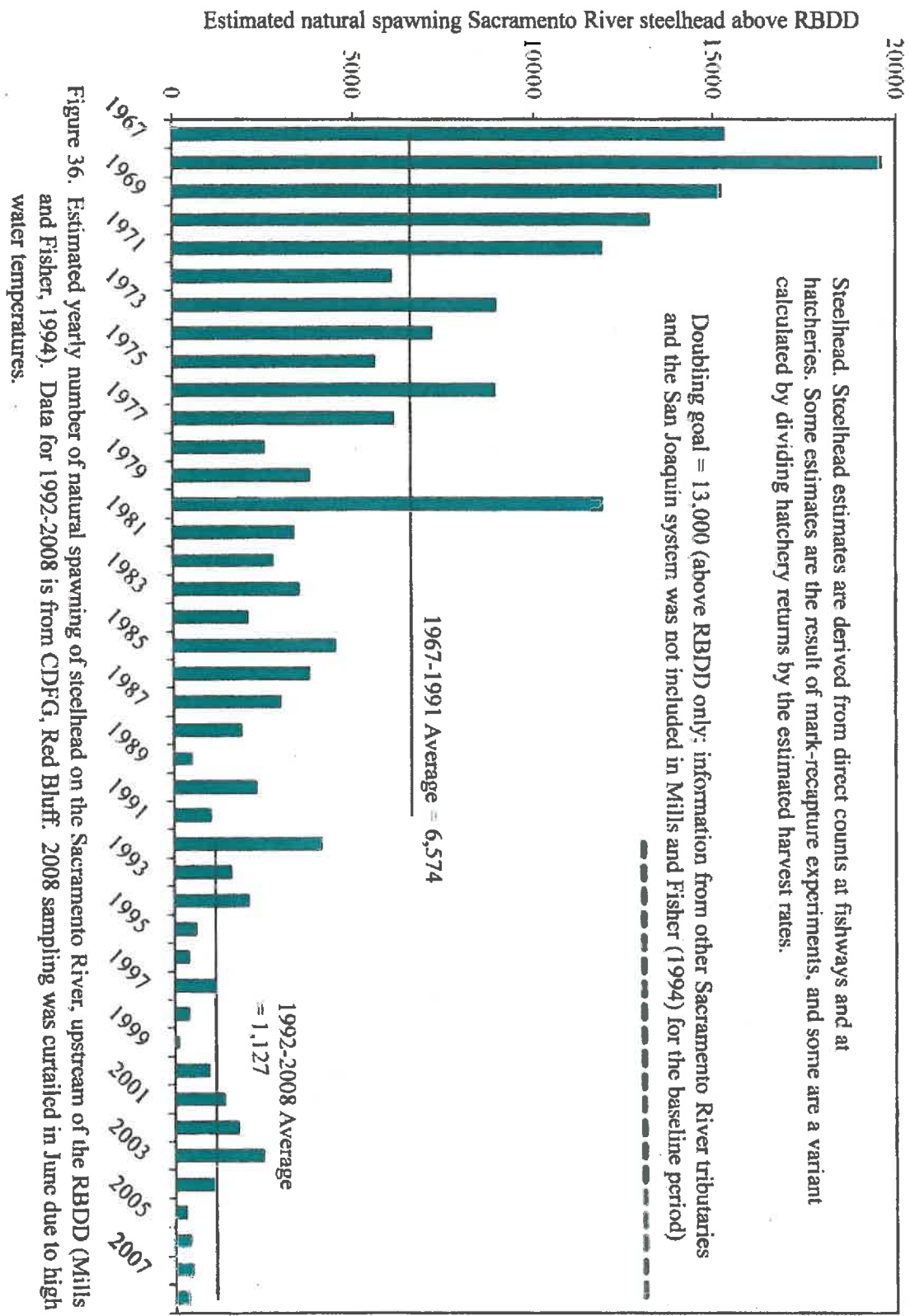


Figure 36. Estimated yearly number of natural spawning of steelhead on the Sacramento River, upstream of the RBDD (Mills and Fisher, 1994). Data for 1992-2008 is from CDFG, Red Bluff. 2008 sampling was curtailed in June due to high water temperatures.

executed. The criteria in the draft agreement were recommended by Fish and Game and endorsed by the Department, and were extensively analyzed by the Board staff. Based on our most current assessment, the fishery standards provide significantly higher protection than existing basin plans. The Striped Bass Index is a measure of young bass survival through their first summer. The Striped Bass Index would be 71 under without project conditions (i.e., theoretical conditions which would exist today in the Delta and Marsh in the absence of the CVP and SWP), 63 under the existing basin plans, and about 79^{3/4} under this decision.

While the standards in this decision approach without project levels of protection for striped bass, there are many other species, such as white catfish, shad and salmon, which would not be protected to this level. To provide full mitigation of project impacts on all fishery species now would require the virtual shutting down of the project export pumps. The level of protection provided under this decision is nonetheless a reasonable level of protection until final determinations are made concerning a cross-Delta transfer facility or other means to mitigate project impacts.

3/ There is some indication that factors other than those considered in the Board's analysis of without project levels may also affect striped bass survival. The effects of these factors are such that the without project levels would be greater than 71. However, the magnitude of this impact is unknown and cannot be quantified at this time.

D 1485
1978

NO SHUT DOWN
INSTEAD
INCREASED EXPORT

D 1485

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051837

Suisun Marsh. Full protection of Suisun Marsh now could be accomplished only by requiring up to 2 million acre-feet of freshwater outflow in dry and critical years in addition to that required to meet other standards. This requirement would result

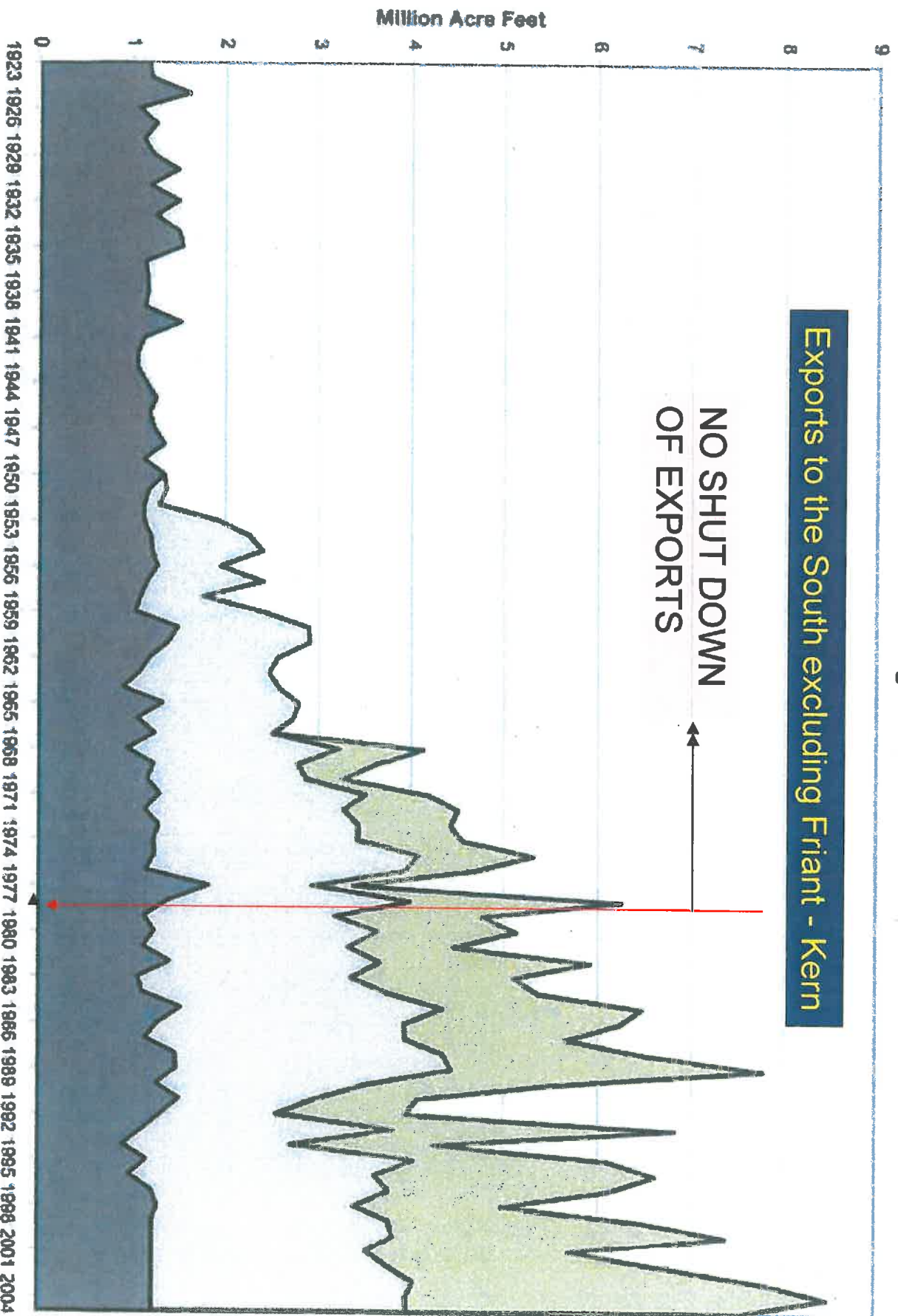
in a one-third reduction in combined firm exportable yield of State and federal projects. In theory, the existing Basin 5B plan purports to provide full protection to the Marsh. However, during the 1976-77 drought when the basin plan was in effect, the Marsh received little if any protection because the system almost ran out of water and emergency regulations had to be imposed. This decision balances the limitations of available water supplies against the mitigation responsibility of the projects. This balance is based on the constitutional mandate "...that the water resources of the State be put to beneficial use to the fullest extent of which they are capable..." and that unreasonable use and unreasonable diversion be prevented (Article 10, Section 2, California Constitution).

The Bureau, the Department, Fish and Game, and U. S. Fish and Wildlife Service are working together to develop alternative water supplies for the Marsh. Such alternative supplies appear to represent a feasible and reasonable method for protection of the Marsh and mitigation of the adverse impacts of the projects. Under this decision the Department and Bureau are required, in cooperation with other agencies, to develop a plan for Suisun Marsh by July 1, 1979. The Suisun Marsh plan should ensure that the

NOT PROVIDED

■ In-Delta Diversions ■ Tracy Exports ■ Banks Exports

Figure 6



Luna B. Leopold
Consulting Engineer

October 1987

California must take heed of well documented experience in x) the Soviet Union where diversion of fresh water from the natural supply to an estuary has resulted in immense economic loss and the near destruction of an important estuary. Regulation of the Don River has resulted in an increase of salinity of the Azov Sea by a mere 7 percent and the result was to reduce total fish production from about 15 to 3 thousand tonnes annually. This has been documented in detail by Volovik (1986) and reviewed in the Tiburon report here being discussed.

The Tiburon report as it will here be called is a detailed study of the water situation in the Sacramento Delta. The reference is:

Rozengurt, M., Herz, M.J., and Feld, S., 1987, Analysis of the influence of water withdrawals on runoff to the Delta-San Francisco Bay ecosystem (1921-1983): Paul F. Romberg Tiburon Center for Environmental Studies, Tech. Rept. No 87-7.

This voluminous study cannot be either read or taken lightly for it is statistical, detailed, and in many places less than clear. Nevertheless, the more one studies it the more impressive is the informational content. The present review deals only with the discussion and data dealing with annual flow data whereas the Tiburon report analyses both annual and monthly data.

The present discussion is an attempt to bring out those points that seem most significant and to present some reanalysis to clarify and emphasize some of the important conclusions.

The data base is reviewed in some detail. It appears that during the planning and construction stages of water development and diversion in the Sacramento system, two somewhat shortcut data compilations were used. The "Four River Index" is a data base that includes runoff from only 75 % of the total drainage area. A "modified method" had previously been employed also selecting less than the full runoff. Finally a compilation was made that estimated the runoff not only from the major rivers but included runoff from the foothill areas and is thought to represent a good approximation of the full runoff volume of 100% of the basin area.

The Tiburon report shows that the planning done in the early years based on these less than full runoff volumes have given an over-optimistic picture of the water available for diversion from the Delta system.

x) emphasis added

Natural outflow less Regulated Outflow
Average values in millions of acre feet

Time Period	Depletion
1921-1929	3.77
1930-1939	3.79
1940-1949	4.73
1950-1959	6.64
1960-1969	8.74
1970- 1979	10.94
1980-1982	12.70

In conclusion, my studies confirm the general conclusions in the Tiburon report. The depletions have been massive and continue to increase. They have greatly increased the percentage of years of critical drought in the Delta and the Bay.

It is my professional opinion that no set of standards of water quality can be written that can have the practical effect of protecting the ecosystem from further degradation if diversions increase over the present level. Because forecasts of runoff are imperfect the effect of diversions in a year that turns out to be dry will already have taken its toll on the ecosystem before water quality measurements can compare the condition with the standards.

The logical and in my opinion the imperative step is to preclude henceforth any additional diversions of water from the Delta system.



SACRAMENTO - SAN JOAQUIN
DELTA CONSERVANCY

February 3, 2011

Honorable Matt Rexroad, Chair
Yolo County Board of Supervisors
625 Court Street, Room 201
Woodland, CA 95695

Subject: Sacramento-San Joaquin Delta Conservancy Involvement in Habitat
Restoration Actions from Proposed Conaway Ranch Agreement

Dear Chairman  Rexroad and Board Members:

On behalf of the Sacramento-San Joaquin Delta Conservancy (Conservancy), I wish to express our interest in partnering with Yolo County on any future conservation easement and habitat restoration activities that may result from the revised Conaway Ranch agreement. We understand this agreement will be brought before the Board for a vote on February 8, 2011, and if passed, will exempt potential conservation easement and habitat restoration actions on 4,000 acres of the ranch from the current county moratorium.

Because of the mandated mission and principles of the Delta Conservancy we expect to partner with and work closely together with Yolo County, as well as all of the Delta counties, in ecosystem restoration activities. As the agency charged with "supporting efforts that advance environmental protection as well as the economic well-being of Delta residents", and as a primary state agency to implement ecosystem restoration in the Delta ((Public Resources Code Section 32322(a) and (b))) we believe conservation and restoration activities undertaken through the Conaway Ranch agreement could be mutually beneficial to both the Conservancy and its mandates, as well as Yolo County, the Yolo Bypass, and the north Delta region overall.

To closely coordinate with ongoing efforts such as the Delta Plan and other large Delta planning activities, the Conservancy has developed an interim strategic plan (http://www.deltaconservancy.ca.gov/docs/SP_public_comment_version_012011.pdf.) This interim plan describes the Conservancy's mission, vision, and guiding principles and begins to definitively outline its role working with local and other state entities. The next step of this process is to develop a final strategic plan which we anticipate will be completed by the end of this year. The final plan will include more specific information

Honorable Matt Rexroad, Chair

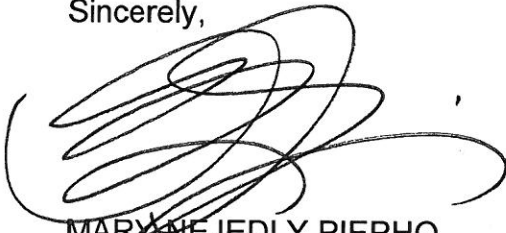
Page 2

February 2, 2011

regarding priority actions and projects for the Conservancy. Opportunities resulting from the Conaway Ranch agreement for habitat conservation and ecosystem restoration highlight the activities the Delta Conservancy is most interested in identifying for its final strategic plan, and are ideal for building strong partnerships between the Conservancy and Delta counties.

This is an excellent opportunity for us to partner with Yolo County in the Yolo Bypass and North Delta regions and implement the mission of the Delta Conservancy.

Sincerely,

A handwritten signature in black ink, appearing to read 'MARY NEJEDLY PIEPHO', with a large, stylized flourish extending from the bottom right.

MARY NEJEDLY PIEPHO

Chair, Sacramento – San Joaquin Delta Conservancy

cc: Sacramento-San Joaquin Delta Conservancy Board Members
Cindy Messer, Interim Executive Officer, Sacramento-San Joaquin Delta Conservancy
Mike Crow, Counsel, Sacramento-San Joaquin Delta Conservancy



SACRAMENTO-SAN JOAQUIN
DELTA CONSERVANCY

February 3, 2011

Terry Macaulay, P.E.
Acting Deputy Executive Officer
Delta Stewardship Council
980 9th Street, Suite 1500
Sacramento, CA 95814

Dear Ms. Macaulay:

Thank you for providing the Delta Conservancy with the opportunity to receive "red flag" review documents related to the Delta Plan. For the purposes of reviewing these documents and complying with the Delta Stewardship Council's (Council) request for confidentiality, I am submitting in writing, the information requested by the Council that will serve as a confidentiality agreement between our agencies.

The individuals authorized to receive these draft documents on behalf of the Delta Conservancy include:

- The Executive Officer
- Cindy Messer, Interim/Assistant Executive Officer

The Delta Conservancy commits to using these drafts for purposes consistent with existing law. We commit to notifying Council staff within five business days of receipt of a PRA request which may or may not include the draft or drafts and will not disclose those records prior to consultation with the Council staff regarding the request.

Once again, thank you for providing us with this opportunity and we look forward to working with the Council through the Delta Plan development process.

Sincerely,

Cindy Messer
Interim Executive Officer
Sacramento-San Joaquin Delta Conservancy

cc: Sacramento-San Joaquin Delta Conservancy Board Members